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ABSTRACT

This guide is intended to assist vocational supervisors in expanding their knowledge of microcomputers and to provide resources to assist them in working with their faculty. Section I presents competencies deemed necessary for an administrator to use the computer as a tool in the conduct of his/her job. Section II focuses on planning for computers. It includes a planning checklist, suggested topics for inservice programs, an outline for installation of a computer laboratory, a description of the Macon Computer Center, information on educational and computer periodicals, training worksheets, and information about learning resource center development. Section III focuses on selecting hardware and includes results of the "PC World" poll of popular hardware. Section IV discusses computer maintenance and operation. It covers the operating environment, computer installations, initial operation, maintenance of system components, dealing with operating problems, and maintenance contracts. Section V addresses software evaluation. Differences in evaluating administrative and instructional software are considered, and software evaluation forms are provided. Information is presented on copyright laws and tips on buying software. Listings are provided of software in use in Georgia, winning products of the "PC World" world-class contest, vocational software publishers, and typical software for program areas. A glossary is appended. (YLB)

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MICROCOMPUTER RESOURCE GUIDE

FOR

VOCATIONAL ADMINISTRATORS

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Developed by: Center for Vocational Leadership
Georgia State University
Vocational & Career Development Department
University Plaza
Atlanta, Georgia 30303

Founded by: Georgia State Department of Education
Office of Vocational Education
Atlanta, Georgia 30303

August 1985

CE043698

CENTER FOR VOCATIONAL LEADERSHIP

DEPARTMENT OF VOCATIONAL

AND CAREER DEVELOPMENT

GEORGIA STATE UNIVERSITY

PURPOSE

The purpose of the Center for Vocational Leadership is to provide professional preparation and continuing development opportunities for all vocational education leadership personnel in Georgia. The center will utilize training models and materials that reflect the most recent advancemetns and research in the field of management training.

GOALS

The goals of the Center for Vocational Leadership are to conduct quality training; to encourage professional involvement and commitment; and to facilitate a statewide communications network, all of which will be exemplary on a national level. The center will significantly contribute to the development of an informed and competent body of leaders who are surpassed in excellence by none.

"COMMITTED TO EXCELLENCE IN
VOCATIONAL EDUCATION"

TABLE OF CONTENTS

Foreward

I. Computer Competencies for Administrators

II. Planning for Computers
- Planning Checklist
- Implementation Scenario
- Topics for In - Service Programs
- Outline for Lab Installation
- In - Service
- The Macon Computer Center
- Training Worksheets
- The Learning Resource Center

III. Selecting Hardware
- Hardware in Use in Georgia
- The PC World Hardware Poll

IV. Computer Maintenance and Operation
- Installation
- Initial Operation
- Maintenance of System Components
- Dealing with Operating Problems
- Maintenance Contracts

V. Evaluating Software
- Administrative and Support Software
- Instructional Software
- Software Evaluation Forms
- Copyright Laws
- Nine Tips on Purchasing Software

V. Evaluating Software (con't)

Software in Use in Georgia

Winners of the PC World Poll

Vocational Software Publishers

Typical Programs for Selected Subject Areas

FOREWORD

Advances in technology have brought about a new way of life and numberous changes for the field of education. With the development of microcomputers, educators have begun to take a new look at its use for computer assisted management and computer assisted instruction. Much has been written about implementation of micros for general education but little has been developed to assist administrators and teachers for specific application to vocational education. Realizing the critical need to assist secondary vocational educators in Georgia, the State Department of Education, Office of Vocational Education contracted with the Center for Vocational Leadership at Georgia State University for the development of this Microcomputer Resource Guide.

The Primary objective of the project was the development of a guide that would assist the Vocational Supervisor in expanding his/her knowledge of microcomputers and to provide resources that would assist them in working with their faculty.

Steps taken to accomplish the project objectives included:

Interviews with vocational supervisors to determine their recommendations regarding the subject content needed in a resource guide.

Interviews with persons knowledgeable in the field of microcomputers to determine their recommendations regarding the subject content needed in a resource guide.

- A survey instrument was sent to all vocational supervisors in Georgia's Comprehensive High Schools. Results of the survey provided the project staff with information regarding: competencies needed by a vocational supervisor, microcomputer hardware presently being used in the local schools, microcomputer software being used by various program areas, and comments/suggestions offered in regard to maintenance and/or future plans for the implementation of microcomputers.
- Letters were sent to over 400 Software Vendors / Distributors requesting information on software available for vocational programs areas.
- Additional research activities were conducted in order to locate various instruments / resources available to assist the vocational educator.

Acknowledgement is due to all who participated in the above listed activities. However, additional appreciation is extended to : Carol Swinney, Macon Computer Center and Dr. Ken Allen, Georgia State University for their technical assistance; Sara Amanda Allen, McEachern High School for technical assistance and the preparation of the final document, Dr. Harmon Fowler, Chairman of the Department of Vocational And Career Development at Georgia State University for his guidance and support; and of course to the staff of the Office of Vocational Education for their recognition of the need for this project.

The ultimate success of the project will depend upon you, the user of the guide. The project staff recognizes that in this fast changing world, you will constantly need to add, delete, and modify the information contained with this publication.

Dr. Judy H. Hulsey
Director, Center for
Vocational Leadership

UTILIZING THIS GUIDE

This document is designed to be of utility ot the vocational administrator as he or she plans for the implementation of microcomputers into the instructional program. It is a compilation of many pieces of information from a variety of sources that have been brought together in a catalog sort of format.

Most of the sections stand alone and may be extracted for use as handouts or even masters for visuals in some cases.

This is particulary true of the "Planning for Computers" section and of the "Evaluating Software" section.

We have tried to put together as many sources for additional information, and include as much practical material as possible.

We sincerely hope this book will be of benefit to your institution.

The Authors

COMPUTER COMPETENCIES FOR ADMINISTRATORS

ADMINISTRATIVE COMPETENCIES

Presented in this section are competencies deemed necessary for vocational supervisors and administrators. These competencies were developed through a review of literature in the field and input from a survey of vocational supervisors in the state conducted by the Vocational Leadership Center at Georgia State University. These competencies are intended to form the minimum foundation of skill and knowledge that is necessary for an administrator to use the computer as a tool in the conduct of his or her job. Competencies are also given which define the administrators role in providing leadership to the teaching staff in the utilization of the computer in the instruction process.

COMPETENCY AREAS

A. Assist staff in the implementation of computer based systems.
   - A1. Promote the integration of computers in classroom instruction/management.
   - A2. Develop a plan for the integration of computers into classroom instruction/management.
   - A3. Guide staff in the selection of software/hardware.
   - A4. Arrange for inservice/staff development for staff and support personnel in microcomputer implementation.
   - A5. Establish a microcomputer learning resource center for staff.
   - A6. Evaluate effectiveness of microcomputer utilization.
   - A7. Establish an information network with other computer users to assist staff in systems implementation.

B. Utilize microcomputers to accomplish admininstrative tasks.

B1. Develop specifications for hardware purchases.

B2. Develop specifications for purchase of applications software.

B3. Utilize microcomputer for accounting and physical management.

B4. Utilize microcomputer for student record keeping.

B5. Utilize microcomputer for personnel record keeping.

B6. Plan and develop communication networks where appropriate.

B7. Utilize word processor programs.

C. Evaluate Computer Software

C1. Distinguish between general purpose and instructional software.

C2. Identify sources of information on general purpose and instructional software.

C3. Read and interpret software reviews.

C4. Define important software terminology.

C5. Identify special equipment required for program operation

C6. Adhere to copyright law when utilizing programs.

C7. Use advisory committees for software and system evaluation

C8. Identify variables important to software selection based on individual needs such as, output required cost, equipment compatibility, networking and communication requirements, graphics requirements, ease of utilization, sophistication of users etc.

D. Evaluating Hardware

D1. Read and interpret evaluations from computer literature.

D2. Define computer output requirements.

D3. Define common systems terminology.

D4. Identify and evaluate variables that are important in computer selection.

D5. Write specifications for computer hardware.

PLANNING FOR COMPUTERS

PLANNING FOR COMPUTERS

It is essential to plan adequately for the effective use of computer systems in the school environment. Obviously the first decision should rest on output requirements, that is what do we want a computer to do and how will it help us do things better ? Unfortunately this is not the thought process that is used by many schools. Generally, the incentive is something like "we have got to get into this computer business." The why's and wherefore's take a back seat to "keeping up with the Jones's" and leaping onto the computer bandwagon.

The wise administrator will, however, first decide what the computer can do to help, gather information on all facets of the various systems and their capabilities, and initiate joint planning/training meetings with staff members to make important decisions in systems implementation. We will present several pieces of information that should help in this process.

A. A checklist of questions to consider.
B. A typical scenario of how one school system might handle computer implementation.
C. An example of an outline for an inservice program.
D. An example for an inservice on the development of a computer lab installation.
E. Information on the Macon Computer Center, and invaluable ally for developing a computer literate staff.
F. A listing of periodicals that can provide an enormous amount of information on the state of the art in the microcomputer world.
G. Examples of worksheets that have been developed by some schools to assist in training teachers on various equipment.

Before you send in a purchase order for a microcomputer, answer the following questions:

1. What purpose will the computer serve in your school? Is it to be used for teaching computer programming, for computer-assisted instruction, for classroom management and record keeping? How much memory will it need to achieve your purpose? Will it need a disk drive or two? Is color a priority? Do you want graphics? Is portability a necessity? Do you need a printer? Could the computer accept input from a scanner?
2. Who will be in charge of the equipment once it is installed?
3. Who will see that everyone who uses it is properly instruced BEFORE they use it?
4. Where will the equipment be used?
5. Where will it be secured overnight and over holidays?
6. Who will decide whether the computer needs repairs? Who will repair the equipment? Where will the repair monies come from? Who will take the machine to the repair shop and pick it up?
7. Who will coordinate the investigation of sources of computer software? Do they know that software cannot be returned if it turns out to be inappropriate? How much money will be set aside for computer software, texts, supplies and instructional materials?
8. Who will schedule the use of the computer? Will the computer remain in one place or will it be moved from room to room? How will it be moved?
9. Are there adequate power outlets in the areas where the computer will be used? Will there be a need for extension cords? Is the power source reliable (without neaby equipment on the same circuit)?

10. What training will your computer teachers have ? Will they be familiar with the specific computer model you purchase before they are expected to use it in the classroom?
11. Will parents be used to help with the implementing of your program? Who will schedule their time? How will they be recruited? Have you discussed school use of computers in you local advisory committee meetings?
12. What curriculum will be taught? Is it already written? If not, who will provide materials?

CONFER BEFORE YOU COMMIT monies and staff. Become informed and your venture into the exciting field of computers can be a very rewarding experience. GOOD LUCK.

AN IMPLEMENTATION SCENARIO

The school makes a decision to implement a centralized computer facility as opposed to having computers added piece meal to various departments (this is a key decision involving administrative support and guidance). Teachers and administrators begin early on to develop priorities and prepare a detailed management plan to insure that the priorities are carried out.The decision is made that the computer will primarily be used to enhance the ongoing instructional program through student learning packages and through classroom management applications by instructors . A secondary utilization will be to teach computer programming in selected classes.

A user's group of qualified teachers is formed. A chairman is elected who handles the responsibilities of scheduling the facility, maintenance, and budgeting of supplies.

The first period teachers in the users' group meet to determine their own laboratory schedule for the semester. Then each period's teachers determine their schedules in succesion. The system also includes a free-floating rotation period to accomodate students during lunch and study hall, for extra work during class time and for teacher training.

Teachers set up a courseware library in the lab for each subject area's software. They also establish a carol section to which they can assign individual students for remedial help or independent study .

Several microcomputers are always kept in a neutral section of the school where they can be loaned to individual classes for the computer awareness presentation , a prerequisite for any class to be scheduled into the laboratory. These computers can

also be loaned to individual teachers for computer-related projects in the classroom.

In the laboratory itself, the network of computers is linked to the teacher's master or host machine. From this machine ,the teacher can not only see each student's display screen, but also monitor and record his or her individual progress. The host machine also contains the disk drive that runs the network and controls the printing function for the entire system.

The laboratory is also used to teach computer progamming. The centralized approach allows a continuity of computer programming knowledge leading from grade to grade, with each level building on the previous one. Continuity has been found more difficult to achieve when individuals were teaching computer programming in separate subject area classes.

This computer facility is kept as a neutral installation and not associated with a department. The facility is run by teachers in the user group presided over by an elected chairperson. There is no designated lab teacher as each teacher is responsible for their students' progress.

SUGGESTED TOPICS FOR INSERVICE PROGRAMS

I. Getting acquainted with your computer
   - A. Components of a microcomputer system
     1. CPU
     2. I\O
     3. Memory
   - B. Capability of a microcomputer
     1. Text
     2. Sound
     3. Graphics
     4. Animation
   - C. A tutorial program
   - D. Learning to control your computer (some simple commands)
   - E. Booting a computer system
   - F. Running, loading, and listing programs
   - G. Initialization and care of a diskette
   - H. How to use "catalog" and menus
     1. Menu driven programs
     2. Identifying program types
     3. Protecting (locking)
     4. Unlistable programs
     5. Protecting a diskette
     6. Using commercial programs that require rebooting
     7. Modifying a simple drill and practice program

II. Instructional applications for computers
   - A. Types of instructional programs
     1. Demonstration
     2. Drill and practice
     3. Tutorial
     4. Simulation
     5. Educational games

B. Characteristics of "good" programs
   1. User friendly
   2. Error free
   3. Trapped errors
   4. Internal/external documentation
   5. Ease of use
   6. Modifiability

C. Evaluation of programs
   1. Establishing criteria
   2. Reporting results

D. Programming in Basic (for experienced software users only)

E. Other programs for your computer
   1. Word processing software
   2. Logo
   3. Authoring languages
   4. VisiCalc
   5. DB-Master (data base system)

III. Management applications for computers

A. Test generation
   1. Storing items in item pools
   2. Editing items and item files
   3. Test construction - random and visual selections

B. Interactive testing
   1. Creating tests
   2. Administering and scoring tests
   3. Keeping track of students

C. Test Scoring
   1. Reading and scoring tests
   2. Storing test
   3. Test analysis

D. Grading / Record keeping
   1. Averaging grades
   2. Computer grade books

IV. Context of computer impact
   A. Milestones in computer developement
   B. Uses of computers in today's work place
   C. Future potential of computer technology
   D. Resources for today's teacher
      1. Journals
      2. Catalogs
      3. Georgia educational software library
      4. Places to visit (schools and colleges)
   E. Issues related to computers
      1. Copyright
      2. Literacy - What should students learn?
      3. Acquiring and maintaining software and hardware

V. Staff developement for computer literacy
   A. Concerns for the non-user
      1. Awareness of its potential
      2. Initial involvement
      3. Activities for continuing involvement
   B. Designing an inservice program
      1. Initial activities
      2. Nurturing the interested
      3. Diagnosing the non-interested teacher's needs

HOW TO SET UP A COMPUTER LABORATORY

I. How to care for equipment
   A. Parts of a computer system
      1. CPU
      2. I/O
      3. Memory
   B. Do's and don'ts
      1. Eliminate static electricity
      2. Care of diskettes
      3. Use of disk drive or recorder
      4. Use and care of a printer
      5. CRT

II. Where to set up computers
   A. A few (1 - 5)
      1. In media center
      2. In _____ classroom
   B. A classroom setting
      1. Arrangement of computers
      2. Who is responsible?
      3. Where is it housed?
      4. How is it scheduled?

III. How will it be used?
   A. Administration
      1. Electronic gradebook
      2. Inventories
      3. Data base management
      4. Electronic spreadsheet
      5. Word processing
      6. Scheduling
      7. Attendance
      8. Guidance
   B. Instructional

1. Typing tutor
2. Music theory
3. Teacher Utilities
4. Authoring systems
   - Shell games
   - Quick quiz
   - Pilot
   - Author
   - Private tutor

C. Computer literacy
   1. Commercial products
   2. Teacher prescribed

D. Remediation

E. Developmental

F. Special needs

G. Languages to be taught
   1. Basic
   2. Logo
   3. Fortran
   4. Cobol
   5. Fortran
   6. Others ...

H. Preservice/Inservice training

I. Use by community

IV. Cautions

A. Don't write on disksettes

B. Write-protect all class diskettes

C. The "thumbs up" rule

D. Keep diskettes in sleeve

E. Never open cover of computer (Apple)

F. Post rules prominently and enforce them strictly

G. Provide enough time to prevent frustration

H. Keep computer secure

I. Spray carpet to prevent static electricity

J. Place computer out of glare from sun
K. Avoid chalk dust
L. Try to anticipate need to expand
M. Make instructions clear and concise
N. Make liberal use of task cards
O. Isolate machines from rest of class
P. Make setup comfortable
Q. Maximize effective use of computer

V. Classroom ideas

A. Use damaged diskette.
Open it to show students how it is made.

B. Use a kitchen timeer to help students budget their time at the computer.

C. Require a program to be written and/or flowcharted before allowing a student to "key it in".

D. Develop a set of 5 by 8 inch task cards for future use. Let students put a solution on the back.

E. Use a word search puzzle to review computer terminology.

F. Write and illustrate a class computer dictionary as a class project.

G. Color code (and/or number) to easily identify diskettes.

H. Use poker chips to keep score in programs that do not have internal scoring procedures.

I. Establish a class bulletin board about computers in the news.

J. Hold a "debugging" party.

K. Invite local "experts" to address your class.

L. Issue computer licenses to students for their accomplishments.

MACON COMPUTER CENTER

The Macon Computer Center located on the campus of Macon Area Vocational Technical School is one of the most important resources available to educators for the implementation of their programs.

The center was established as a consortium of effort between the State Department of Education and the local school systems. At present, 67 school systems are members after consortium members have been given first opportunity for services.

The center conducts a broad range of workshops every year and a master schedule of activities is provided to each school system. All workshops scheduled on a first come first served basis. Workshop topics cover the following basic areas:

1. Local Resource Personnel Developement
   This is a new and major activity that will be piloted for the State of Georgia for one year, using the Educational Technology Task Force to provide in-depth training for local resource personnel by involving them in intensive workshops of one day to three days during a six to eight month interval. It is anticipated that the superintendent will choose one or more persons from the school system who will participate in the scheduled workshops, that are designed to prepare them to return to their respective school systems to conduct local training or serve as a resource person.
2. Computer Awareness (Beginning)
   This is a one (1) day intensive workshop designed for participants to become knowledgeable of the computer through "hands on" practice in microcomputer operations. Additionally, this

class (or an equivalent) is prerequisite to all other classes unless computer aqareness is offered in conjunction with a major workshop.

3. Computer Awareness (Advanced)

   This is a two-day (2-day) intensive workshop designed for participants to become users of some specific applications. Possible topics are listed below.

   - Word Processing
   - Data Bases
   - Scheduling
   - Spread Sheets
   - Attendance
   - Grade Report
   - Teacher Utility
   - Programming

4. Guidance Counselors, Curriculum Directors, Secretaries, Teachers, Media Specialists, Principals, Superintendents, and Transportation Personnel Workshops.

   These one (1) and two (2) day workshops are designed for the groups in their specific fields to address identified needs as determined by appropriate DOE and system-level personnel. Some possible topics and/or activities for the above groups will include the following:

   - Software Evaluation Techniques
   - Demonstration of Application Software Packages
   - Hands-On Experience with Application Software Package
   - Techniques for Implementing Software Applications

5. Technology in Business and Industry Interchange

   This is a proposed one (1) day session designed to bring people together from business.

industry, and education, for purposes of examining and/or discussing issues related to preparing students to meet the technology challenge of the information age in business and industry. Arrangements will be made for several companies to conduct mini-workshops, seminars, demonstrations, etc., concurrently.

6. Software Sharing
   Five (5) days have been set aside for consortium members to come together to discuss and/or share information on software products that have been developed at the system level and successfully used by students, teachers etc. in a variety of disciplines.
7. Hardware Preview
   This is a proposed one (1) day session designed to inform people how to evaluate and purchase hardware. Three (3) to four (4) different brands of microcomputers will be accessible for "hands-on" evaluations.
8. Software Preview
   This is a proposed one (1) day informal session that will allow individuals to preview software from a variety of vendors.

The Center has a library of software available for preview purposes and can provide a catalog for review. They also have public domain software that may be copied during regularly scheduled workshops.

The center utilizes the following types of equipment:

Apple IIe, II+, and III
IBM PC
IBM PCjr
Lanier LBP
Radio Shack Model 4
Commodore 64

For additional information contact:

Carol Swinney
Computer Center
Macon Area Tech
3300 Macon Tech Drive
Macon, GA. 31206
912-781-0551

EDUCATIONAL PERIODICALS

ACM SigCUE Bulletin
4 issues $20.00
ACM, Incorporated
P.O. Box 12115
Church Street Station
New York, New York 10249
212-869-7440

A newsletter published by the Association for Computing Machinery.

AEDS Journal
4 issues $32.00
Association for Educational Data Systems
1201 Sixteenth Street, N.W.
Washington, DC 20036
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Association for Educational Data Systems
1201 Sixteenth Street, N.W.
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Belmont, CA 94002
415-592-7810

Contains many applications on computers for learning and teaching.

Educational Computing Research
4 issues $88.00
Baywood Publishing Co.
Box D
120 Marine St.
Farmingdale, NY 11735
800-547-7500

Current research and analysis in the field of educational computing.

Educational Computing Magazine
10 issues $25.00
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Post Office Box 535
Cupertino, CA 95014
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Educational Technology
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Reports on current applications
of computers in education.

Computers in the Schools
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The world's largest group of Apple users. Maintains a hotline to answer queries.

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Tacoma, WA 98445
206-581-6038

Lists and describes programs for the Apple.

InCider
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Peterborough, NH 03458
603-924-9471

Articles on how to get more from an Apple II. Excellent.

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Box 325
Lincoln, MA 01773
617-259-9710

Contains application and utility information

Softalk
12 issues $24.00
P.O. Box 7039
North Hollywood, CA. 91603
818-980-5074

Software and hardware reviews, columns for educators. Excellent Complimentary one year subscriptions for new owners.

Apple Education News
4 Issues Free
20525 Mariani Avenue
Cupertino, CA 95014
408-996-1010

Contains industry updates and educational computing news.

Computer Student
6 issues $9.95
217 Jackson Street
Lowell, MA 01852
617-459-7181

Contains projects and articles written to enable readers to keep abreast of Apple technology.

The Scarlett Letter
12 issues $12.00
1301 N. 19th St.
Norfolk, NE 68701
402-379-3531

Contains programs and hints for Apple users. An educational section is included.

PERIODICALS FOR THE COMMODORE COMPUTERS

Ahoy!
12 issues $19.95
Suite 407
45 W. 34th St.
New York, NY 10001
212-239-0855

News, reviews, articles and programs for the Commodore C-64 and Vic 20.

Commander
12 issues $22.00
P.O. Box 98827
Tacoma, WA 98498
206-584-6757

Compares equipment and software and describes innovative ways to use the Commodore.

Compute!'s Gazette
12 issues $20.00
P.O. Box 5406
Greensboro, NC 27403
800-334-0868

Compute's version specifically for the Commodore and Vic 20.

Microcomputer Magazine
6 issues $15.00
1200 Wilson Dr.
West Chester,PA 19380
215-431-9100

Sections on business and educational applications for advanced users of Vic 20 and Commodore 64.

Power Play
6 issues $15.00
1200 Wilson Dr.
West Chester, PA 19380
215-431-9100

Home and game applications of the Commodore 64 and Vic 20. Recreational oriented.

The Transactor
6 issues $15.00
4901 W. Lemoyne Avenue
Chicago, IL 60651
312-278-7770

Contains software reviews, programs, and information on peripherals for the Commodore.

PERIODICALS FOR THE IBM PERSONAL COMPUTER

PCjr.
12 issues $15.00
Post Office Box 2450
Boulder,CO 80321
800-526-0666

A magazine for users of the IBM PCjr.

PC Magazine
12 issues $27.00
Post Office Box 445
Boulder, CO 80321
800-526-0666

A leading PC-specific publication.

PC Tech Journal
6 issues $19.97
Post Office Box 445
800-526-0666

A journal for advanced users.

PC The Disk Magazine
6 issues $119.00
39 East Hanover Avenue
Morris Plains, NJ 07950
800-526-0666

Each issue includes a disk containing up to 12 programs

PC World
12 issues $24.00
Post Office Box 6700
Bergenfield, NJ 07021
800-247-5470

A leading PC-specific publication.

Personal Computer Age
12 issues $18.00
10057 Commerce Avenue
Tujunga, CA 91042
213-352-7811

Wide coverage on many areas of interest

Personal Computer Journal
12 issues $95.00
West 2317 Garland
Spokane, WA 99205

News and helps for IBM manuals. Includes a disk with each issue

Reference
6 issues $18.00
Post Office Box 1200
Amherst, NH 03031
603-673-9544

Nontechnical periodical for prospective business users of the IBM PC.

Softalk for the IBM Personal Computer
12 issues $24.00
Educational rate $12.00
Softalk/IBM Circulation
Box 60
North Hollywood, CA 91603
213-980-5074

Articles for uers at all levels. IBM PC owners may receive the first 12 issues free.

PERIODICALS FOR THE RADIO SHACK COMPUTERS

The Color Computer Magazine
12 issues $24.97
1 Park Ave.
New York, New York 10016
800-631-8112

Specifically for the color computer.

Color Micro Journal
12 issues $12.50
5900 Cassandra Smith Rd.
Hixson, TN 37343
800-338-6800

Contains articles for both the beginning and advanced user of the Radio Shack Color Computer.

Computer User
12 issues $20.00
16704 Marquardt Avenue
Cerritos, CA 90701
213-926-9544

Covers all of the Radio Shack line. Education and home are emphasized.

80 Micro
12 issues $36.00
80 Pine Street
Peterborough, NH 03458
800-258-5473

Contains a section with ideas for classroom applications.

Hot CoCo
12 issues $25.00
80 Pine Street
Peterborough, NH 03458
800-258-5473

Specifically for the color and TRS-100 computers.

Rainbow
12 issues $28.00
9529 U.S. Hyw. 42
P.O. Box 209
Prospect, KY 40059
502-228-4492

Specifically for the color computer.

TRS-80 Microcomputer News
12 issues $12.00
P.O. Box 2910
Fort Worth, TX 76113
817-390-3100

Contains new product information, programming tips and listings. New owners receive a six month subscription free.

GENERIC PERIODICALS

Business Software Magazine
12 issues $18.00
Management Information Source
3543 N.E. Broadway
Portland, OR 97232
503-287-1462

Business software reviews

BYTE Magazine
12 issues $21.00
70 Main St.
Peterborough, NH 03458
603-924-9281

Contains the current news on software and hardware.

Computerworld
51 issues $44.00
797 Washington Street
Newton, MA 02160
800-343-6474

A weekly newspaper that covers everything in the computer world! Excellent!

Creative Computing
12 issues $24.99
Post Office Box 789-M
Morristown, NJ 07412
800-631-8112

A general computing magazine. Good.

Datamation
12 issues $42.00
Technical Publishing Co.
875 Third Avenue
New York, NY 10022
212-605-9400

Excellent for experienced users.

Infoworld
51 issues $31.00
375 Cochituate Road
Box 880
Framingham, MA 01701
800-343-6474

A weekly newspaper specifically for microcomputer users.

Interface Age
12 issues $21.00
McPheters, Wolfe and Jones
16704 Marquardt Ave.
Cerrites, CA 90701
213-926-9540

Articles are business related.

Micro
12 issues $24.00
P.O. Box 6502
Chelmsford, MA 01824
617-256-3649

Aimed at the experienced microcomputer user.

Microcomputing
12 issues $25.00
80 Pine Street
Peterborough, NH 03458
603-924-9471

Specifically for the home computer user.

Peachware Quarterly
4 issues $9.00
Peachtree Software
3445 Peachtree Road
Atlanta, GA 30326
404-239-3000

Reviews the current uses of computers in business.

Desktop Computing
12 issues $25.00
Wayne Green, Inc.
80 Pine Street
Peterborough, NH 03458
603-924-9471

A journal written in nontechnical language.

Popular Computing
12 issues $15.00
Post Office Box 307
Martinsville, NJ 08836
800-258-5485

Covers the latest trends in the microcomputer world.

Simulation
12 issues $42.00
Post Office Box 2228
La Jolla, CA 92038
619-459-3888

Covers computer simulations used in all areas.

Softside
12 issues $30.00
10 Northern Blvd.
Northwood Executive Park
Amherst, NH 03031
603-882-1422

Software reviews for the Apple, Atari, IBM, and others - specify yours when ordering.

Personal Computing
12 issues $14.97
Hayden Publishing Co.
Post Office Box. 2942
Boulder, CO 80322
800-525-0643

Emphasis is on creating your own software.

Software News
12 issues $25.00
875 Third Avenue
New York, NY 10022
Technical Publishing Co.

Emphasis on the corporate use of computers.

Spreadsheet
12 issues $42.00
Intercalc
Post Office Box 254
Scarsdale, NY 10583
914-472-0038

Articles related to many different brands of spreadsheets.

APPLE WORKSHEET I

1. Turn on the television.
2. Follow instructions given in class regarding handling the disk.
3. Insert "APPLE Presents. . .APPLE" disk. Be sure to close the door!
4. Locate ON/OFF toggle switch on back left corner of the APPLE; turn computer ON.
5. Follow the instructions on the disk and check the programs below as you complete them.
   The ESC key may be used to advance you to the MENU for continuation of this series or for reveiwing a program on this disk at a later time.
6. When you have finished with the computer, turn the computer OFF through the toggle switch near the back left corner.

Program Check-Off

____ 3. The early RETURNs are out.
____ 4. A SHIFT of character
____ 5. Arrows, rabbits, and gnomes
____ 6. Color or B & W
____ 7. Why "10" isn't a ten
____ 8. Apples, apples everywhere
____ 9. Making your ESCape (and RESET)
____ 10. Friendly advice
____ 11. The three cursors
____ 12. Disks: a command performance
____ 13. Watch this space
____ 14. I want to quit for now

APPLE WORKSHEET II

The purpose of this worksheet is to help you feel comfortable with the computer. When you finish this activity you should be able to:

--turn on the computer and RUN a program
--change from one program to another program
--stop a program in three different ways
--state the difference in TEXT and GRAPHICS mode
--get a list of the programs on a disk
--use the APPLE paddles
--end a session with the microcomputer properly

1. Engage CAPS LOCK on keyboard.
2. Turn on the television. Follow the directions given in class AND ...
3. Insert the ED DEMO disk into the disk drive. BE SURE TO CLOSE THE DOOR.
4. Locate the ON/OFF switch on the left back corner of the APPLE and turn computer on.
5. Locate the POWER LIGHT on the front row of the keyboard. Type: RUN HANGMAN (press the RETURN key)

Don't forget to press RETURN when you have finished typing each line. Play HANGMAN going through five words. When the blanks for the sixth word appear, you should move on to the next item on this

Note in the lower left of the screen the flashing cursor and the > (PROMPT). This promp indicates that you are out of the program.

7. Type: CATALOG
   Note: This gives you the list of programs on the disk.
8. Type: RUN SINK THE SHIP
   Follow the direction and play the games several times.
9. Type: CATALOG
   What happened?

_____

_____

Note: The screen can be in TEXT MODE or GRAPHICS MODE. Graphics mode is used for pictures--text mode is used for letters. To change text mode type: TEXT

10. Type: TEXT
    What happened?

_____

_____

11. Type: CATALOG
12. Type: RUN LEARN MUSIC
    When you finish with this program, go to number 13.
13. Get a CATALOG.
14. Type: RUN WILLIAM TELL OVERTURE
    Note: What you hear is coming from a two-inch speaker located on the left side of the keyboard

17. Type: CATALOG
    What happened?

    _____

    _____

18. Type: TEXT
    What happened?

    _____

    _____

    _____

    Remember: TEXT cannot come on the screen when it is in GRAPGHICS MODE.

19. Type: CATALOG
20. Type: RUN APPLE VISION
21. When this program is finished, turn off ON/OFF switch at the left back corner. Check the POWER LIGHT on the keyboard to be sure it indicates the machine is off.

Answer the following questions?

1. List the three steps in turning on or "booting" the APPLE

   _____

   _____

   _____

2. List four ways to stop a program.

   _____

   _____

   _____

4. How do you get a listing of programs on a disk ?_____

_____

5. You are in a program that has pictures and you want to get out of this program to the CATALOG. List the steps you should follow.

_____

_____

_____

6. What were the following special keys used for ?

(a) CONTROL RESET _____

(b) CONTROL C _____

(c) Left-point and right-point arrows _____

_____

(d) CAPS LOCK _____

UNIT OBJECTIVES
AND STUDY GUIDE

SUPERSCRIPSIT
TRS-80

Before beginning this unit, you will need to learn about the following :

1. Operation of the tape recorder and use of the instructional tapes.
2. Location of instructional materials and the reference guide.
3. How to use and protect diskettes. How to insert diskettes into the CRT. Where to store them.
4. How to turn on the power for the printer and the CRT.
   Note : Turn on the printer first. Then turn on the CRT. CRT will be turned off first. Then the printer. COMPUTER ON LAST, OFF FIRST.

LESSON 1

Objectives :

You will learn how to
1. Insert diskettes.
2. Load Superscripsit Program
3. Use cursor arrows.
4. Use wraparound and indent.
5. Use proportional spacing.
6. Quit a document.
7. Print.
8. Return to a document.
9. Shut down the system.

Procedures :

Begin the tape recorder with Lesson 1. Follow the directions until the voice says, "Before we load Superscripsit, we will use a special command to make a backup." DO NOT MAKE A BACKUP. We already have one. Wait for the speaker to finish the backup procedures. Then continue to follow directions. KEEP THE PAGES WHICH YOU PRINT OUT ON THE PRINTER.

Study Questions :

1. What is a ghost cursor ?
2. What does Pos. 3.7 mean ?
3. What does PS mean ?
4. LS:1 means _____.
5. "Cen" means that the machine will _____.
6. On the tab line, what does "I" stand for?
7. Numbers 1-5 on the tab line represent numbers of _____.
8. What i

UNIT OBJECTIVES
AND STUDY GUIDE
TRS-80 SUPERSCRIPSIT

LESSON 2

Before you begin, Read P. 15. Figure 2-1.

Objectives :

You will learn how to
1. Answer open document options.
2. Edit the tab line (change margins and tabs).
3. Work with Superscripsit's main typing features : center, tab, align tab, view mode, and caps mode.
4. Use the basic editing features : insert, delete and quick margin change.

Procedures :

Listen to the tape. Complete exercises as directed. Keep all printed pages.

To learn about open document options, you will open the CARS document and use Figures 2-2, 2-3, and 2-4.

To learn about the tab line, you will use Figure 2-5. To learn about centering, you will use Figure 2-7.

Study Questions :

1. To clear tab, position the ghost cursor and press _____.
2. To set margins, position the ghost cursor and press _____ or _____.
3. To set tabs, position the ghost cursor and type _____ for an indent tab or _____ _____ for a tab.
4. To see an index of Scripsit commands, press CONTROL - _____.
5. What must you do to lock in the margin and tab settings after you have made your changes?
6. To center a line of text, hold down _____ and type C.
7. To uncenter, hold down CONTROL and type _____.
8. To type at an align tab, hold down CONTROL and type _____. To end the alignment, type _____, press enter, or tab to the next tab stop.
9. To view embedded codes, turn on view mode by holding down CONTROL-_____.
10. To turn off the view mode,_____.
11. To type with all caps, hold down _____ and press control.
12. To delete a character, hold down CONTROL and type _____.
13. To insert text, position the cursor where you want to insert the text. Then hold down CONTROL and type _____.
14. Type the text you want to insert. Then press _____ to close up the text.

1. To move the cursor to the next video page, hold down the _____ arrow plus v.
2. To move the cursor to the next printed page, hold down the _____ arrow plus p.
3. You can instruct Superscripsit to move to a specified phrase by holding down the down arrow with the _____key. (Then answer the prompt).
4. You can move the cursor to a specified page number by typing down arrows plus the _____ key.
5. To override the lines per page option, you should use the "forced new page code." Hold down CONTROL with _____.
6. To define a block, move the cursor to the starting point and hold down CONTROL with _____(for start).
7. To end the block, position the cursor on the paragraph symbol at the end of the text you want to define. Then hold down CONTROL and type _____ (for end).
8. What symbols appear on the screen to designate beginning and ending of blocks?
9. To select a block-action command, hold down CONTROL and _____. Choose one of the options and type the first letter.

Match the following print control codes with the clues.

____Clear +	1. Strikethrough
____Clear -	2. Subscript
____Clear =	3. Double underscore
____Clear *	4. Pause Printout
____Clear .	5. Bold Print
____Clear >	6. Underscore
____Clear /	7. Superscript
____Clear ?	

LEARNING RESOURCE CENTER

No matter what the computer is to be used to do or how the equipment is to be dispersed within the school, it is extremely advisable to develop some sort of central facility to house basic information and resources. This "Learning Resource Center" should contain several computers that can be used to review software, develop programs, communicate with other data bases or whatever other purpose is desired.

The resource center should house literature and periodicals on computers and be a library for software of a generalized or administrative nature not otherwise assigned to a specific teacher.

The administrator must in some way assign responsibility for scheduling and utilizing the resource center as it is likely to be a popular place. Other points to keep in mind are:

. Assign the responsibility of managing the LRC to several staff people who have computer expertise.

. Keep a detailed inventory and check out system.

. Provide adequate security of the room at all times.

. Do not use the room for student activities.

. Spend the funds necessary to secure quality books, periodicals, and software.

. Develop the LRC as the focal point of computer activity in the school.

. Encourage all faculty to use the LRC by providing them with adequate time during the school day.

. Encourage the use of the center to develop in house software projects.

. Provide as many computers as the budget will permit and staff size indicates, so that teacher's limited time can be well used.

. Schedule a computer competent teacher to conduct training sessions after school for other staff members.

. Remember to recognize, reward, and otherwise encourage teachers who try to learn more.

. Encourage the development of users' group or even a faculty computer club which can utilize the center for meetings.

. Solicit vendors, advisory committee members, or other experts who will donate time for special presentations in the center.

. The LRC should make extensive use of the many excellent tutorial and instructional software packages that are available such as the comprehensive ATI Training material (American Training Institute).

SELECTING HARDWARE

Volumes have been written about how to select computer hardware. It is no more difficult thought process than evaluating any other piece of equipment except for the fact that there are a great number of variables involved and these variables often involve concepts and terminology that most administrators are not familiar with. Adding to the problem is the fact that this is the most fiercely competitive sales market on earth and sales representatives are often willing to claim almost anything as a capability for their product. Additionally, new and more powerful computers are introduced almost every day. As a matter of fact, computer speed and power has been doubling about every 18 months for the past several years. There are three basic procedures that should be followed and they parallel the decision you make about software. (You really are making system decisions and it is impossible to select one without carefully considering the other.)

1. Determine exactly what you want the computer to do. If a system is to be used for instruction and lots of terminal time is important for example, the cost per unit in question is extremely important. You must weigh your evaluation criteria based on a clear understanding of you needs.
2. Become as knowledgeable as you can give your time to make the decision. Read a lot of reviews, talk to a lot of other users, look at a lot of equipment. Insist on a demonstration of hardware capabilities, performing a task that is important to you. You must become in some way computer literate to make an adequate choice.

3. Have the equipment rated and evaluated by staff who are computer competent. Collect rating forms on important variables if you think you need them for an analysis.

In general, the following areas are important to most users:

1. Cost per unit
2. Service/Warranty availability
3. Software availability/quality
4. Peripherals - What kind? How many?
5. Graphic capabilities/quality
6. Screen display - color, clarity
7. Keyboard - Ease of use, standardization
8. Sound/Music availability
9. System expansion - Memory, storage, peripherals
10. Programming Languages - Which ones?
    How many?
    Are others possible?
11. Communication and networking capabilities
12. Power and speed - Is multi-tasking possible?

To further amplify on the above, there are certain key questions about hardware that the educational user must consider:

What is the range, quality, and selection of software that is available?

Is software produced for older machines compatible with the company's newer models?

Does the company support industry standardization such as for cable, disk, and cassette design?

What is the company's reputation for machine and user support?

How stable is this company's predicted continual involvement in the microcomputer industry?

Has the addition of new equipment to the company's line meant that older models were discontinued?

Is it possible to upgrade older models to gain new and improved capabilities?

Since the computer industry changes so rapidly, it is really a newsworthy area that many publications cover with the same intensity as a political campaign. A good idea is to read reviews that are regularly published on the state of the industry. A good example is an article entitled "The Hardware Game: Sorting the Winners from the Losers" by O.E. Dyrli in Classroom Computer Learning, April/May, 1984.

One of the best methods to use in gaining information regarding microcomputer hardware, is to talk with "users" of the type you have considered purchasing. The following pages contain a list of the Comprehensive High Schools that use various name brand micros and the number of each they have purchased. If you have questions, give them a call or pay a visit to their institution.

Sometimes it seems that hardware evaluation boils down to a popularity contest. If that is true, then the results of a recent survey conducted by PC World magazine to ascertain the most popular hardware to support the IBM PC should be of interest in assessing much equipment. This poll follows the hardware in use list.

APPLE COMPUTERS

II+	IIe	III
Brooks County (1)	Cherokee H.S. (2)	Bacon Co. (4)
Southwest Macon (8)	Rabun County (13) NW	
Chattooga Co. (1)	Gwinnett Voc. Center (1)	
Forest Park (6)	Calhoun High (1)	
Oconee Co. (1)	Waycross High (6)	
Riverdale H.S. (5)	Heritage H.S. (17)	
Lanier Co. (1)	Thomasville City (2)	
Lumpkin Co. (6)	Kendrick (2)	
McEachern H.S. (2)	Brunswick H.S.(1)	
	Southwest Macon (3)	
	Valdosta (20) NW	
	Oglethorpe City (9)	
	North Cobb (2)	
	Lafayette H.S. (1)	
	Madison Co. (11)	
	Seminole Co. (1)	
	Forest Park (11)	
	Oconee Co. (12)	
	Dooly Co. (12)	
	Riverdale H.S. (9)	
	Coosa H.S. (11) NW	
	Shaw H.S. (15) NW	
	Forsyth Co. (1)	
	Lanier Co. (6)	
	Rockmart H.S. (2)	
	Effingham Co. H.S. (1)	
	East Laurens H.S. (1)	
	Lumpkin Co. (19)	
	Coffee Co. (5)	
	Calhoun Co. (5)	
	McEachern H.S. (12)	

RADIO SHACK COMPUTERS

MODEL I	MODEL II	MODEL III
Cairo (1)	Cherokee (2)	Miller Co. (1)
North Cobb (20)	Americus (1)	Cherokee (10)
Chattooga Co. (2)	Brunswick (2)	Americus (2)
Hawkinsville (2)	Valdosta (7)	Calhoun (17) NW
Calhoun (3)	Seminole Co. (1)	Brooks City (1)
Riverdale (1)	Chattooga Co. (3)	Cairo (3)
Evan Co. (2)	Evans Co. (1)	Oglethorpe City (3) NW
Calhoun Co. (1)	Lanier (1)	Lafayette (10) NW
	Coffee Co. (2)	Seminole Co. (8)
		Chattooga Co. (11) NW
		Winder Barrow (9)
		Hawkinsville (6)
		Peach County (16) NW
		Forsyth Co. (2)
		Evans Co. (1)
		Lanier Co. (4)
		Effingham Co. (11) NW
		East Laurens (11)
		Coffee Co. (1)

MODEL 4	MODEL 12	MODEL 16	MODEL 100
Cherokee (5)	Coffee Co. (1)	Rockmart (1)	Coffee Co.(2)
Americus (12) NW	Effingham Co. (1)	Miller Co. (1)	
Calhoun (1)		Coffee Co. (1)	
Brooks City (5) NW			
Pickens County			
Cairo (5)			
Oglethorpe City (2)			
Lafayette (2)			
Chatooga Co. (6)			
Coosa (1)			
Evans Co. (17)			
Rockmart (11) NW			
Effingham Co. (1)			
East Laurens (8)			

IBM COMPUTERS

P.C.	P.C. Jr.
North Cobb (13)	McIntosh (1)
McIntosh (1)	
Coffee Co. (1)	
McEachern (5)	
Walton (5)	
Osborne (10)	
South Cobb (10)	

COMMODORE COMPUTERS

# 64	Vic 20
Cherokee (1)	Cherokee (1)
Claxton (20)	Clayton (3)
Coffee Co. (6)	Coffee (25)

ATARI COMPUTERS

Forest Park (4)

MINI-COMPUTER SYSTEMS

Texas Instruments

Heritage H.S. - DS990 10 terminals

McEachern H.S. - DS990 15 terminals

IBM System 34

Riverdale

Kendrick

Marietta

Columbus

Spencer

Jordan

Hardaway

Dekalb OEC North

DOT MATRIX PRINTERS

APPLE

Lumpkin Co. (1)
Madison Co. (1)
Chattooga Co. (1)
Forest Park (3)
Oconee Co. (2)
Dooly Co. (3)
Riverdale (2)
Forsyth Co. (1)
Lanier Co. (2)
Rockmart (2)
Effingham Co. (1)
Coffee Co. (3)
Calhoun Co. (2)
Rabun Co. (3)
Calhoun City (1)
Waycross (1)
Heritage (1)
Thomasville City (2)
Kendrick (2)
Brunswich (1)
Oglethorpe Co. (1)
Lafayette (1)
Bacon Co. (4)

TRS-80

Chattooga Co. (1)
Winder Barrow (4)
Hawkinsville (3)
Seminole Co. (2)
Peach County (2)
Evans Co. (5)
Rockmart (2)
Effingham Co. (2)
Coffee Co. (4)
Cherokee (4)
Americus (2)
Brunswick (1)
Oglethorpe Co. (3)

EPSON

Forest Park (5)
Lumpkin Co. (1)
Coosa (3)
East Laurens (4)
Claxton (2)
Coffee Co. (10)
Waycross (1)

OKIDATA

McIntosh (1)
Madison Co. (2)
Lumpkin Co. (7)
East Laurens (1)

COMMODORE

Claxton (5)

TEXAS INSTRUMENTS

Heritage (1)
Lumpkin Co. (1)
McEachern (2)

DAISY WHEEL / LETTER QUALITY PRINTERS

TRS-80	TEXAS INSTRUMENTS	QUME
Lanier Co. (3)	Heritage (1)	Gwinnett Voc. Center
Coffee Co. (2)	McEachern (1)	
Americus (1)		
Calhoun (1)		
Pickens (1)		
Cairo (2)		
Lafayette (2)		
Forsyth Co. (1)		

NEC	DYNAX
Oconee Co. (1)	Lumpkin (1)

WINNING PRODUCTS FOR THE
WORLD CLASS PC CONTEST: HARDWARE

CATEGORY	PRODUCT	MANUFACTURER
Compatible Computer	1. Compaq-Plus Portable Computer	Compaq Computer Corp. 20333 FM 149 Houston, TX 77070 713/370-7040 $4995.00
	2. Columbia MPC	Columbia Data Products
	3. Tava PC	Tava Corp.
	4. Sperry PC	Sperry Corp.
	5. Columbia VP	Columbia Data Products
	6. Chameleon	Seequa Computer Corp.
	7. Corona PC	Corona Data Systems
	8. Zenith PC	Zenith Data Systems
	9. Eagle PC Plus	Eagle Computer, Inc.
	10. Radio Shack TRS-80 2000	Tandy Corp./ Radio Shack
	11. Eagle PC Spirit	Eagle Computer, Inc.
	12. TeleVideo TPC-II	TeleVideo Systems, Inc.
Color Monitor	1. HX-12	Princeton Graphic Systems 170 Wall St. Princeton, NJ 08540 800/221-1490 $695.00
	2. IBM Color Display	IBM

CATEGORY	PRODUCT	MANUFACTURER
Printer - Letter Quality	3. NEC 7700 Series	NEC Information Systems, Inc.
	4. Printmaster F-10	C. Itoh Electronics, Inc.
	5. Brother HR-25 Daisy Wheel Printer	Dynax, Inc.
	6. Sprint 11/40-130 Plus	Qume Corp.
	7. Juki 6100	Juki Industries of America, Inc.
	8. 855	Texas Instruments, Inc.
	9. Daisywriter 2000 Printer	Computers International Inc.
	10. NEC 2050	NEC Information Systems, Inc.
Printer - Dot Matrix	1. FX Series	Epson America, Inc. 2780 Lomita Blvd. Torrance, CA 90505 213/539-9140 $895.00
	2. MX Series	Epson America, Inc.
	3. Microline 92	Okidata
	4. Microline 93	Okidata
	5. 800 Series	Texas Instrument, Inc.
	6. Prowriter 8510A	C. Itoh Electronics, Inc.
	7. MT Series	Mannesmann Tally
	8. Toshiba P1350	Toshiba America, Inc.

CATEGORY	PRODUCT	MANUFACTURER
Color Monitor	3. Color II Plus	Amdek Corp.
	4. Quadchrome	Quadram Corp.
	5. Color IV	Amdek Corp.
	6. Taxan 400 Series	Taxan Corp.
	7. JC 1203	NEC Information Systems, Inc.
	8. ZVM 136	Zenith Data Systems
Hard Disk	1. Tallgrass TG-3012 (12MB hard disk drive with 20MB tape backup.)	Tallgrass Technologies Corp. 11100 W. 82nd St. Overland Park, KS 66214 913/492-6002 $3495.00
	2. Davong Hard Disk Systems	Davong Systems, Inc.
	3. Iomega Bernoulli Box	Kamerman Labs
	4. 10M	Corvus Systems, Inc.
	5. Pegasus 10 (shugart 10MB)	Pegasus
	6. WS-1, WS-2, and WS-3	Maynard Electronics
Printer - Letter	1. NEC 3550 Spinwriter	NEC Information Systems, Inc. 1414 Massachusetts Ave. Boxborough, MA 01719 617/264-8000 $2290.00
	2. Model 630 ECS	Diablo Systems, Inc.

CATEGORY	PRODUCT	MANUFACTURER
Printer - Dot Matrix	9. Gemini Series	Star Micronics, Inc.
	10. P-Series	Data Products
	11. RX-80 Series	Epson America, Inc.
	12. DS 180 Matrix Printer	Datasouth Computer Corp.
Plotter	1. HP 7475A Plotter	Hewlett-Packard 16399 W. Bernardo Dr. San Diego, CA 92127 619/487-4100 $1895.00
	2. HP 7470A Plotter	Hewlett-Packard
	3. Amplot II Plotter	Amdek Corp.
	4. HIPLOT DMP-40 Plotter	Houston Instrument
Modem	1. Smartmodem 1200	Hayes Microcomputer Products, Inc. 5923 Peachtree Industrial Blvd. Norcross, GA 30092 404/449-8791
	2. Smartmodem 1200B	Hayes Microcomputer Products, Inc.
	3. PC-212A/1200 Modem Card	Qubie'Distributing
	4. Smartmodem 300	Hayes Microcomputer Products, Inc.
	5. PC212A	Rixon Inc.

CATEGORY	PRODUCT	MANUFACTURER
Modem	6. Password with Telpac	U.S. Robotics, Inc.
	7. VA 3450	Racal - Vadic
Disk Drives	1. TM 100-2	Tandon Corp. 20320 Prairie St. Chadworth, CA 91311 818/993-6644 $290.00
	2. 9400 Series	Control Data Corp.
	3. SA Series	Shugart Corp.
	4. FD Series	TEAC Corp. of America (TCA)
	5. Amdisk V	Amdek Corp.
Color Graphics Board	1. Color/Graphics Adapter	IBM Entry System Division P.O. Box 1328 Boca Raton, FL 33432 800/447-4700 $244.00
	2. Graphics Master	Tecmar
	3. PC +	Plantronics Enhanced Graphics Products
	4. Graphics Card	Hercules Computer Technology
	5. Quadcolor I	Quadram Corp.
	6. Graphics Edge	Everex Systems, Inc.
	7. MultiDisplay Card	Paradise Systems,Inc.
	8. MAI Multiple Interface Board	Amdek Corp.

CATEGORY	PRODUCT	MANUFACTURER
Color Graphics Board	9. Graphix Plus	STB Systems, Inc.
	10. Color Display Adapter	Persyst, Inc.

COMPUTER MAINTENANCE AND OPERATION

Today's high sophisticated computer systems are a great deal more rugged and reliable than the average user would probably expect. They are, however, complex pieces of equipment with unique characteristics that require that certain details be attended to. For the most part they are really not that much more complex than an electric typewriter or copy machine, but since they often are the oracle of information, that is extremely important, and usually critical, to efficient operation of the organization. A malfunction can be a crisis of extraordinary proportion. In this section we will attempt to give some general guidelines and procedures for efficient operation and maintenance of microcomputers. The user is also strongly advised to read and thoroughly understand all vendor documents related to his or her system.

THE OPERATING ENVIRONMENT

A computer is not different from a television or similar electronic device in that "noise" generated by powerful electrical voltage such as from vacuum cleaners, power tools and the like will create problems. Also, computers require a clean, reasonably dry, and reasonably cool environment, just as do other such sophisticated devices. It is a fundamental fact that the low voltage, digital circuits, which comprise the "innards" of a computer are affected by significant environmental variations. The following are considered advisable precautions:

* Maintain reasonable temperature and humidity. From 15 C (60^ F) to 30^ C (85^ F) is considered the optimal temperature range. 40 to 70 percent humidity is likewise considered optimal. Most computers are also fan cooled to control internal temperatures.

* Control dust and lint. Dust covers and regular cleaning are recommended.

* Utilize a dedicated power source. That is, a direct line form fuse box to computer that does not have other outlets that might contribute unwanted electrical noise. The outlet should be rated high enough to handle the computer and its peripherals with no problem. This is usuallly for 10 to 20 amps. BE CERTAIN TO ASSESS THE LOAD DRAWN BY CERTAIN PERIPHERALS PARTICULARLY PRINTERS WHICH MAY BE HIGHER THAN THE COMPUTER ITSELF.

* Be cautious of any electrical system which is heavily loaded overall, such as is often the case in schools. The line which supplies the computer should be as lightly loaded as possible.

* In general, you will find that if you can operate an electric typewriter, stereo, or T.V. in a given environment, you can also operate a computer. Do not expect a computer to function well under extreme temperature or humidity conditions, in a dirty area, or in the presence of excessive electrical noise. Such things as dust covers, line filters, constant voltage transformers, and options like larger fans, special housings and a better power supply can all enhance performance and lower the possibility of malfunction. All in all, it must be said that the critical statistic which engineers refer to as MTBF (Mean Time Between

Failures) is very high for the typical personal computer, if the user does his part.

COMPUTER INSTALLATIONS

Proper installation of the computer can be extremely helpful in preventing inconvenience and possible damage to the system. As it is used over a period of time, you will find considerable need to move, unplug and re-configure the system for all sorts of purposes including cleaning and maintenance, rearrangement of workspace, addition of more equipment, etc. The system should be initially installed so as to anticipate easy management and rearrangement of peripherals. Clutter, loose or unmarked cables and crowding of equipment should be avoided. Remember that detachable monitors and printers will require 3 separate plug-in receptacles. This many power cords especially in classrooms with several micros, can soon become an unsightly maze of wiring. Other installation suggestions are :

* Save boxes and packaging documents as you may need warranty and shipping information.

* Try to arrange each system into a convenient workstation having uncluttered wiring and easy access especially to printers. Arrange for convenient storage of all accessories such as disks, paper, ribbon, manuals, etc. Custom desks for such purposes are available.

* The key to arrangement of equipment is ease of access to all controls, peripherals, connectors, and cables. Equipment can be damaged in fumbling with untidy hardware and wiring.

* Provide a reasonable writing surface so that the keyboard, the printer, or other equipment are not used for this purpose.

* Anticipate that equipment will be replaced or updated and leave room for expansion of the system.

* Identify all cable ends and connectors with labeling tape to facilitate reconnection when the system is inevitably disassembled.

* Carefully and clearly label all manuals and programs.

* Be especially cautious in stacking books, or other materials on or around the computer and its related devices. This equipment was not built for this purpose and it is easy to inadvertently block proper ventilation.

INITIAL OPERATION

The computer should not be used until thorough understanding of initial operation is achieved. There are three basic ways and obvious combinations of the three which may be employed to gain the needed knowledge.

- Vendor or commercially available training classes.

- Self study through vendor documentation and manuals.

- Tutorial instruction programs which use the computer itself to present instruction.

Most purchasers make use of 2 or more of these methods. Initial users confront numerous basic questions before they can ever put the device to any application, such as :

- How do you turn it on and off ? (not as simple as it might seem someetimes)
- How do you stop or reset the machine ?
- Is the order in which things are done important ? (often it is)
- How do you load a simple program ?
- How do you load and use systems software such as operating systems, editors, assemblers, etc ? (some may be in ROM while other must be loaded from a disk or in some other way).
- How do you load an application program ?

A common prorblem encountered by most people is that manuals and texts are either too technical, poorly written, or both. The most effective operating skills can probably be gained by combining the three methods listed above. Excellent tutorial packages are available on the most popular systems and software. A good way to select a vendor is to assertain how much training support and related software they will make available and at what cost.

Maintenance of System Components

The CPU

The internal electronic components of the CPU have a long (500 years or more) life expectancy. With the exception of power spikes on the magnitude of a

CRT

A CRT is about the same thing as a TV set. Observe the following maintenance rules:

- Provide proper ventilation
- Clean the screen regularly
- Verify operation of all functions on a regular basis.
- Do not set the brightness too high.
- Do not leave the terminal on for long periods of time when not in use.

PRINTER

The printer is the device which routinely provides the greatest number of maintenance and operation problems. It is, after all, a highly sophisticated device, involving a large number of electrical, electronic, and mechanical components all under the control or influence of a computer program. In addition, the seemingly simple act of feeding and extracting paper can cause even the most accomplished computer person some degree of difficulty from time to time.

An investment in a quality printer is well worth the expenditure. In those environments which depend on quality output, such as business offices, a good printer is essential. High reliability and the availability of rapid service are critical in the selection of a printer for most applications

The following suggestions are important:

- Follow carefully the instructions in the manual. Clean and lubricate the printer as indicated; such service is usually part of a maintenance contract.

- Use high-quality ribbons and paper.
- Insert paper carefully. Be sure that it is aligned properly, both at the sides and at the top and bottom.
- Ensure proper ventilation, particularly if you isolate the noise from the printer with a cover or shroud.
- Test all options regularly.
- Keep the output from piling up or blocking the flow of paper from the printer. Baskets and other holders are often available.

THINGS NOT TO DO

- Don't force anything. Don't try to force the paper in or out or do anything to the mechanism.
- Don't expect an inexpensive, light-duty printer to operate continuously and produce massive amounts of output.
- Don't drop anything into the mechanism.
- Don't put your hands into the printer while it is operating.
- Don't turn the printer off while it is printing.

DEALING WITH OPERATING PROBLEMS

The well publicized "computer error" is a fact of life in dealing with these miraculous devices. From a technical standpoint malfunctions are really no different from a jammed key, or any other problem in a business machine. But since such problems often occur in situations in which critical data are vulnerable, they can take on a great deal more importance.

If the computer malfunctions the standard procedure is to restart or resume what you were doing, this may involve resetting the computer and beginning from square one. It is important to remember that problems with malfunctions can be significantly reduced in impact it proper documentation and backup procedures are followed.

It is advisable to secure test programs to be certain of the nature of problems in some instances. These programs called diagnosics, check various functions of system operation. They can rapidly differentiate hardware from software problems for example. Diagnostic programs may be sold by the vendor, or produced by a third party. They are usually worth the trouble and/or expense to secure them.

Typical diagnostics may change each word of memory to see if it prints correctly. They may check printer output programs and then display and print all characters, or they may check disk function progress to see if data is recorded properly.

Even if you do not plan to attempt in-house maintenance or repair (as most users do not) isolation of the parameters of the problem will assist the repair people in getting the system rapidly back in service.

Consider the following :

- Determine when the problem occurs. Find out which programs are running and which peripherals are being used. Look for key factors such as length of operation, time of day of previous problems.
- Record all information in a maintenance log, this will help provide precise documentation if problems

reoccur.

- Check all connections to see that they are firmly in place. This is a common source of problems.
- Try to isolate the part of the computer that is at fault. Begin with a minimal operation unit that you know is operating properly, then recorrect other devices until the fault occurs. Diagnostic programs are a great help in locating which unit may be faulty.
- One of the easiest checks is to compare operations of the unit with a unit that you know is working properly.

MAINTENANCE CONTRACTS

Whether or not to buy a maintenance contract is often a difficult decision. In general the utility of such a contract may be measured in terms of the cost of down time. Obviously a system which drives an entire instructional program, or stores vital information cannot be risked to a great deal of down time.

Most stand-alone micro systems can be backed up by the availability of replacement units. Any user is well advised to study the issue of maintenance contracts very carefully and purchase or procure as much insurance as the utilization of the system implies and the track record of the hardware and software seem to warrant.

lightning surge they can be expected to last virtually forever ,unless there was some form of quality defect in their manufacture.

We reiterate some cautions:

- Be sure that ventilation is not blocked to avoid excess heat and resultant malfunction.
- Be sure that all cables are properly identified and connected.
- Be sure workspace is uncluttered and all equipment and controls easily accessible.
- Never remove anything from the computer unless you are totally sure what you are doing .Under no circumstances, remove anything when the system is under power.
- Keep static charges away from the computer. Carpeted rooms are especially a problem in this regard. A room humidifier and antistatic mats are sometimes required to reduce problems .

Floppy Disks

Floppy disks are much like phonograph records and require many of the same precautions.

- Keep dust away from disk drive by keeping door closed as much as possible.
- Diskettes can easily warp if not properly kept and handled. Keep them in their boxes and stored in an upright position.
- Label all diskettes.
- Check carefully the instructions for inserting and removing diskettes from the disk drive.
- Duplicate all disks for backups.
- Use the "write protect" function to prevent data

from being accidentally damaged or deleted .

- Keep diskettes away from heat and dust.

DO NOT:

- Write on the disk cover. Write on the sleeve with the disk removed or on labels.
- Leave diskettes lying about unprotected.
- Touch exposed portion of the disk (just paper jacket).
- Let the door of the disk drive slam shut.
- Bend or crimp diskettes.
- Turn the computer off while the disk drive is in use. If the program is in a loop reset the computer.
- Set anything on top of a diskette.
- Contaminate the disk drive with any substance or insert anything into it.
- Use the wrong diskette for a particular machine.
- Expect diskettes to last forever. They have a similar life as do phonograph records.

KEYBOARD

- Keep the keyboard clean. Cover it when not in use. Clean occasionally with a damp cloth.
- Test function keys regularly to be sure they are working.
- Mount the keyboard firmly if it is not attatched.
- Be sure that students or anyone else not spill or drop anything onto the keyboard.
- Do not pound on the keyboard as if it were a manual typewriter.

EVALUATING SOFTWARE

The old expression "It's a jungle out there!" Must have been coined especially for the computer software industry. As computer technology has literally exploded in the last few years the software boom has been more than mind-boggling. No one even knows how many software houses there are in this country today, but it is in the 10's of thousands, and if you count all the one, two, or three person part-time groups formed by engineers, and programmers to make a few extra dollars on a specific project, the number's become incredible indeed. Future Computing predicts that 6,787,000 units of educational software will be purchased by schools and the general public in 1985. The educational user is therefore, confronted with a bewildering array of software that has potential value for his or her program. This section is intended to provide some basic guidelines for plotting your way through the software maze and selecting those products that have value in your own individual situations.

GENERAL CONSIDERATIONS

There are two broad categories of computer software of interest to administrators. (1) General administrative or what might be called program support. This includes items such as scheduling, financial records, inventory, student records, billing and many other applications that either have been designed or should be designed. (2) Instructional software, which includes all student use packages designed for the specific purpose of instruction. There are six basic types of instructional software as follows:

* Drill and practice - which uses the computer for basic skill building drills that were formerly taught in more traditional ways such as the use of workbooks etc.
* Tutorial dialog - which uses computers to present information, analyze student misunderstandings and provide appropriate instruction and practice.
* Management of instruction - which is the utilization of computers in a data gathering and analysis function to trace student progress and provide the instructor with information and may provide suggested alternate activities based on performance.
* Simulation and model building - which uses the computer to guide the student through a logical thought process withing a knowledge system, which may involve understanding the consequences of varying selected assumptions or establishing alternate sets of assumptions.
* Teaching computer related information skills - utilizing the computer to teach things such as record-keeping and fiscal management, word processing, datat entry functions, etc.
* Teaching computer programming - utilizing the computer in the process of teaching the science of application programming.

Somewhat different types of processing must be utilized in evaluating administrative and instructional software. We will give information on both types.

Administrative and Support Software

The best evaluation of administrative programs such as: scheduling, fiscal management, and student records can probably be gained from discussion with other users.

Most popular programs in the general administrative area such as Visicalc, d Base II, Lotus 1-2-3 and the various word processor programs have been around for quite some time. Discussion with other administrators plus a visit to observe the system in action can sum up quite a number of questions quickly. A list of software and users by school is provided in this section. Also, most of the popular programs are reviewed regularly in one or the other of the periodicals included in the resource section of this document. Less widely used programs such is the case in scheduling, applications should be observed at user locations so that output and data base characteristics can be determined.

In general, administrative and support software should be evaluated in light of some of the following basic questions. (A more detailed evaluation model will also be provided).

Does the software yield exactly the kind of output I need?

Will the software run effectively on equipment or is upgrading required?

Is software maintenance provided and do I need it?

Are there documentation and help functions available that will aid my use of the software? (Is it user friendly?)

What do other people say about this program?

Can I change or modify the program to meet my specific needs?

INSTRUCTIONAL SOFTWARE

The evaluation of instructional software is very similar to the evaluation of a text book or an audio-visual unit. Usually there are at least three broad areas of concern (a) Content characteristics (b) Instructional characteristics (c) Technical characteristics. In evaluating instructional software on these points, the reviewer should keep the following in mind:

* If you cannot get a preview of the software in some way, don't buy it. Do not trust vendor promotional write ups.
* Be sure that the intended instructional objectives are fully defined and completely addressed within the program. This is a common shortcoming of educational software developed just to get a product onto the market.
* The user should take the time to review and be knowledgeable of various software houses and their reputations. Reviews in periodicals are helpful in this regard.
* Evaluate whether or not the software has power and flexibility. The best ecucational programs have built-in options that allow for conditional branching and motivational changes as the user works through the activity. That is, there is a high level of interactivity.
* Be careful to insure that material is error free and easy to use . There must be interest gathering just like a good book. If several reivlewers find it boring, you can bet that students will find it twice as boring.

* Whatever software you purchase, while having a stand alone value should, probably be part of a larger more comprehensive series by the vendor.

* Most experts who have written on the subject of software evaluation agree that some form of rating system should be developed. This is again very similar to the textbook adoption procedure used in most school districts.

* The most comprehensive work done in this area is by the Northwest Regional Laboratory (300 S.W. 6th Ave., Portland, Oregon 97204). We are reprinting their evaluation documents along with other examples, with the suggestion that each school create their own such form or apply the sections of these examples that seem to be of value.

MICROSOFT COURSEWARE DESCRIPTION

Northwest Regional
Educational Laboratory

Title _____ Version Evaluated _____
Producer _____ Cost _____
Subject/Topics _____
Grade Level(s) (circle) pre-1 1 2 3 4 5 6 7 8 9 10
12 post-secondary
Required Hardware _____
Available for Hard Disk ?____ YES ____ NO ____ UNKNOWN

Required Software _____
Software protected? _____ YES _____ NO
Medium of Transfer: _____ Tape Cassette _____ ROM Cartridge
_____ 5 1/4" Flexible Disk _____ 8" Flexible Disk
Back Up Policy _____
Producer's field test data is available _____ On Request
_____ With Package _____ Not Available

INSTRUCTIONAL PURPOSES & TECHNIQUES
(Please check all applicable):

_____Remediation	_____Drill & Practice
_____Standard Instruction	_____Tutorial
_____Enrichment	_____Information Retrieval
_____Assesment	_____Game
_____Instructional Management	_____Simulation
	_____Problem Solving
_____Authoring	
_____Other_____	

DOCUMENTATION AVAILABLE:

Circle P-(Program) or S-(Supplementary Material)

P S Suggested grade/ability level(s)
P S Instructional objectives
P S Prerequisite skills or activities
P S Sample program output
P S Program operating instructions
P S Pre-test
P S Post-test
P S Teacher's information
P S Resource/reference information
P S Student's instructions
P S Student worksheets
P S Textbook correlation
P S Follow up activities
P S Other _____

OBJECTIVES: ____ Stated ____ Inferred

PREREQUISITES: ____ Stated ____ Inferred

Describe package CONTENT AND STRUCTURE, including record keeping and reporting functions.

COURSE EVALUATION

PROGRAM NAME _____

PRODUCER _____ COST _____

SUBJECT AREA _____ SCHOOL _____

DATE _____ Check this space if this evaluation is based on your observation of student use of this package.

SA - Strongly Agree A - Agree D - Disagree
SD - Strongly Disagree NA - Not Applicable
Please include comments on individual items on the reverse page.

CONTENT CHARACTERISTICS

1. SA A D SD NA The content is accurate.
2. SA A D SD NA The content has educational value.
3. SA A D SD NA The content is free of race, ethnic, sex, and other stereotypes.

INSTRUCTIONAL CHARACTERISTICS

4. SA A D SD NA The purpose of the package is well defined.
5. SA A D SD NA The package achieves its defined purpose.
6. SA A D SD NA Presentation of content is clear and logical.
7. SA A D SD NA The level of difficulty is appropriate for the target audience.
8. SA A D SD NA Graphics/color/sound are used for appropriate instructional reasons.

9. SA A D SD NA Use of the package is motivational.

10. SA A D SD NA The package effectively stimulates student creativity.

11. SA A D SD NA Feedback on student responses is effectively employed.

12. SA A D SD NA The learner controls the rate and sequence of presentation and review.

13. SA A D SD NA Instruction is integrated with previous student experience.

14. SA A D SD NA Learning can be generalized to an appropriate range of situations.

TECHNICAL CHARACTERISTICS

15. SA A D SD NA The user support materials are comprehensive.

16. SA A D SD NA The user support materials are effective.

17. SA A D SD NA Information displays are effective.

18. SA A D SD NA Intended users can easily and independently operate the program.

19. SA A D SD NA Teachers can easily employ the package.

20. SA A D SD NA The program appropriately uses relevent computer capabilities.

21. SA A D SD NA The program is reliable in normal use.

QUALITY

Write a number from 1 (low) to 5 (high) which represents your judgement of the quality of the package in each division:

_____ Content
_____ Instructional Characteristics
_____ Techincal Characteristics

RECOMMENDATIONS

_____ I highly recommend this package.
_____ I would not use or recommend this package.

---

1. INSTRUCTIONAL RANGE

_____ grade level(s)
_____ abilitiy levels(s)

2. INSTRUCTIONAL GROUPING FOR PROGRAM USE

_____ individual
_____ small group (size:_____)
_____ large group (size:_____)

3. EXECUTION TIME

_____ minutes (estimated) for average use

4. PROGRAM USE(S)

_____ drill or practice
_____ tutorial
_____ simulation
_____ instructional gaming
_____ problem solving
_____ informational
_____ other (_____)

5. EQUIPMENT REQUIRED

_____ 1 Disk Drive

_____ 2 Disk Drives

Additional

Comments: _____

_____

_____

86

SOFTWARE REVIEW

PROGRAM NAME:_____

COLOR:_____ GRAPHICS:_____ SOUND:_____

ERROR FREE:_____ EASY DIRECTIONS:_____

IS ADDITIONAL MATERIAL REQUIRED?_____ TYPE OF PROGRAM:_____

WHAT AGE PERSON IS THIS PROGRAM FOR ?_____

BRIEF DESCRIPTION:

CONCEPTS, SKILLS, OR OTHER INSTRUCTIONAL AREAS ADDRESSED:

PROBLEM SOLVING STRATAGIES NEEDED:

HOW WOULD YOU USE THE PROGRAM ?

COMMENTS:

DATE: _____

NAMES OF PREREQUISITE PROGRAMS

_____

_____

_____

NAMES OF FOLLOW-UP PROGRAMS

_____

_____

_____

DATE OF THIS DOCUMENTATION

_____

CLASSROOM
VALIDATION (DESCRIBE)_____

_____

_____

TIME FOR AVERAGE
EXECUTION ___ MINUTES

88

SOFTWARE EVALUATION CHECKLIST

PROGRAM
NAME: _____ SOURCE: _____
COST: _____ SUBJECT AREA: _____
REVIEWERS NAME: _____ DATE: _____

1. INSTRUCTIONAL RANGE

   _____ grade level(s)
   _____ ability level(s)

2. INSTRUCTIONAL GROUPING FOR PROGRAM USE

   _____ individual
   _____ small group (size:_____)
   _____ large group (size:_____)

3. EXECUTION TIME

   _____ minutes (estimated) for average use

4. PROGRAM USE(S)

   _____ drill or practice
   _____ tutorial
   _____ simulation
   _____ instructional gaming
   _____ problem solving
   _____ informational
   _____ other (_____)

5. USER ORIENTATION: INSTRUCTOR'S POINT OF VIEW

low				high	
*	*	*	*	*	flexibility
*	*	*	*	*	freedom from need to intervene or assist

89

6. USER ORIENTATION: STUDENT'S POINT OF VIEW

low				high	
*	*	*	*	*	quality of directions (clarity)
*	*	*	*	*	quality of output (content and tone)
*	*	*	*	*	quality of screen formatting
*	*	*	*	*	freedom from need for external information
*	*	*	*	*	freedom form disruption by system errors
*	*	*	*	*	simplicity of user input

7. CONTENT

low				high	
*	*	*	*	*	instructional focus
*	*	*	*	*	instructional significance
*	*	*	*	*	soundness or validity
*	*	*	*	*	compatibility with other

8. MOTIVATION AND INSTRUCTIONAL STYLE

passive				active	
*	*	*	*	*	type of student involvement
low				high	
*	*	*	*	*	degree of student control

none	poor			high		
*	*	*	*	*	*	use of game format
*	*	*	*	*	*	use of still graphics
*	*	*	*	*	*	use of animation
*	*	*	*	*	*	use of color
*	*	*	*	*	*	use of voice input and output
*	*	*	*	*	*	use of nonvoice audio
*	*	*	*	*	*	use of light pen
*	*	*	*	*	*	use of ancillary materials
*	*	*	*	*	*	use of _____

SAMPLE SOFTWARE DOCUMENTATION SHEET

PROGRAM NAME:_____

SUBJECT AREA:_____

PROGRAM CLASS

___ isolated program

___ part of a ____ program cluster

INTENDED AUDIENCE(S)

___ teachers

___ students in grade(s)_____

___ other _____

_____

PROGRAM SOURCE

name:_____

address:_____

_____

_____

phone:_____

program cost:_____

SYSTEM REQUIREMENTS

computer:_____

language:_____

memory needed:_____bytes

input mode: cassette

__-inch diskette

cartrige

other_____

_____

output mode: color monitor

B/W monitor

printer

plotter

other_____

PROGRAM USES:(1 = primary
2 = secondary)

___drill or practice

___tutorial

___simulation

___instructional gaining

___problem solving

___informational

___other_____

_____

CRITICAL PREREQUISITE SKILLS

_____

_____

9. SOCIAL CHARACTERISTICS

present and negative	not present	present and positive	
_____	_____	_____	competition
_____	_____	_____	cooperation
_____	_____	_____	humanizing of computer
_____	_____	_____	moral

92

NON-COURSEWARE APPLICATIONS
SOFTWARE SELECTION CHECKLIST

Answer Yes or No

1. Match to Need
   a. Does the software perform the application as specified? ____ ____ ____ ____
   b. Does the software stand alone or is additional software necessary? ____ ____ ____ ____
   c. Does the software store all of the information needed by the user? ____ ____ ____ ____
   d. Does the software provide output in the desired format with all needed information? ____ ____ ____ ____
   e. If speed is a consideration, is the software fast enough? ____ ____ ____ ____
2. Proven Performance
   a. Can you locate other users who are satisfied with the software? ____ ____ ____ ____
   b. Has the software been systematically field tested? ____ ____ ____ ____
3. Modifiability/Vendor Support
   a. Does vendor allow user access to the source code? ____ ____ ____ ____
   b. Does vendor provide updates, error correction? ____ ____ ____ ____
   c. Can vendor be reached for classification and technical assistance? ____ ____ ____ ____
   d. Does vendor provide back-up for additional or destroyed

copies? Is there additional cost for replacement copies? ____ ____ ____ ____

4. Content Validity
   a. Is the content validity of the software documented? ____ ____ ____ ____
   b. Does the software define terms and concepts in a generally accepted manner? ____ ____ ____ ____
5. User Friendliness
   a. Is the software menu driven? ____ ____ ____ ____
   b. Are instructions understandable? ____ ____ ____ ____
   c. Is a "help" function used? ____ ____ ____ ____
   d. Is input appropriate to the task? ____ ____ ____ ____
   e. Is output readable and useful? ____ ____ ____ ____
   f. Does error recovery occur without user having to show system? ____ ____ ____ ____
   g. Can data be recovered, edited and otherwise salvaged? ____ ____ ____ ____
6. Documentation
   a. Does the manual explain the software? ____ ____ ____ ____
   b. Are all eventualities covered in the manual? ____ ____ ____ ____
   c. Is the manual easy to read? ____ ____ ____ ____
7. Is staff training available? ____ ____ ____ ____
8. Price ____ ____ ____ ____
   (2 = reasonable,
   1 = more than I expected)

Number of "Yes's" ____ ____ ____ ____

SOFTWARE EVALUATION CHECKLIST

___ Does the software use the operating system that is standard for your computer system? Or will you have to purchase another operating system in order to run the software?

___ What language is the program written in? Assembly language is the most efficient; compiled languages are also desirable.

___ How much disk storage does the package require? How much disk storage is left for the use of files?

___ How flexible is the package? Can you define the input and output formats yourself or are they fixed?

___ How much RAM (random-access memory) does the program occupy when loaded form disk? What's the total amount of RAM your system should have to make practical use of the program?

___ How much does the package cost?

___ How much are new versions?

___ Will there be enhancements (new features, fixes of limitations)?

___ Will suppliers notify you of new versions automatically?

___ Is the system unconditionally guaranteed to be free of program bugs? What do you have to do to get a replacement?

___ How about backups? Can you use standard procedures built into the operating system, or does the program provide its own backup functions? If the latter is true, can you make an unlimited number of backups?

___ Is the program easy to use?

___ Is the program menu-driven and self-prompting?

___ Does the supplier provide adequate documentation?

___ Does the supplier offer a training course in addition to the manual?

___ Can you get answers to your problems or questions by phone or mail?

___ Can you modify the package to work with nonstandard input/output devices? For example, can you use a serial printer in place of a standard parallel printer?

___ Have any magazines reviewed the program? What did they say?

___ Can you contact any local users for their evaluations?

ADDITIONAL INFORMATION

In order to further assist in the task of selecting software, we are presenting some other pieces of information that may be of value.

(1) The latest interpretation of copytright laws applicable to computer software.

(2) Nine tips on purchasing software

(3) A list of the software currently in use by those schools who responded to the survey which was conducted prior to this publication.

(4) The results of a survey conducted by PC World magazine was reported in their November 1984 issue on the best products and vendors for the IBM PC. Even though not many of the schools surveryed in this project use the PC, the reputation of the various vendors easily extend to their products which are compatible with other machines.

(5) A list of vocational software publishers

(6) A description of typical software packages available for selection program areas.

COPYRIGHT LAWS

The problem of software piracy is a thorny legal issue and a source of controversy within the computer industry. It will probably never be satisfactorily answered and most experts agree that current copyright laws are inadequate to deal with the problem.

Even though educators sometime feel that since their purposes are noble and their budgets small, they have the right to copy programs, the software vendors do not agree. Some major houses such as Lotus Development Corporation have recently actively pursued litigation against unauthorized use of their products.

At present, computer programs are covered under the Copyright Act of 1976 as ammended in 1980. Under this legislation a computer program is treated as a literary work with essentially the same copyright protection. The provision was made in 1980 that the user could make a copy or copies or archival (or backup) to the original disk or other adaptations that were necessary to utilize the software on the user's equipment.

Specifically, this act grants to the vendor (1) reproduction of copies (excluding archival copies) (2) production of derivitive works (3) distribution of copies for sale or lease (4) performance of the work publicly if it is audio-visual (5) display of the work publicly if it is graphic.

Copyrights also extend to all manuals and lesson guides. It is considered and infringement to possess and run a program that is unowned just as with a film. The making of copies for student use in the classroom is an infringement just as if a textbook were copied and distributed to students to defray costs.

The act provides only that the purchaser (1) can make one or more copies for archival purposes - to protect against damage or loss (2) make those adaptations that are necessary to use the program correctly (3) can add features to the program so long as the altered program is not sold or given away without the authors permission.

There are still a number of unanswered questions about software duplication but the stance of the publishing houses both of print materials and software programs has become more hardline over the past few years. It is clear that the wanton abuse of the right of the developer to the rights to reproduction of materials and firmly established and that the teachers and schools who disregard these rights are subject to civil, and in some cases, criminal prosecution.

It does not matter, also, whether the software has a copy protect code or not as some would believe. A program which is copyrighted may not be reproduced other than under the situations given above, whether it is done straightforwardly or through the use of a "copy program."

The only answer for deferring costs for school systems is to either look for public domain software that can be amended, join one of the growing number of consortia such as MECC or explore the possibility of in - house development.

9 VALUABLE TIPS ON HOW TO BUY SOFTWARE

WHERE TO SHOP, WHAT TO BUY, AND HOW TO GET THE MOST FOR YOUR MONEY.

TIP #1: SOFTWARE MAY NOT FOLLOW THE MACHINE

If you do not currently own a microcomputer and are thinking of buying one, don't fall for the salesman's pitch that "the software is bound to follow". Promised software may never materialize. Software for a particular microcomputer depends largely on how well the microcomputer sells. A system that sells hundreds of thousands of units will definitely have software. A successful system not only generates money to fund the manufacturer's software development, but it also motivates other companies to produce software for those hundreds of thousands of systems. Conversely, if a system doesn't do well, software will be scarce.

These days the microcomputer industry is big business with adequate backing, but some of the dozens of companies will inevitably fall by the wayside. To protect yourself from the hazards of such competition, be sure to choose a system that has at least a reasonable number of units already sold and a moderate amount of existing software. And even among existing companies with hundreds of thousands of systems sold, it's not uncommon for software to be unavailable six months later than when it was promised! Never buy a system on promised software.

TIP # 2: BUY AS FEW SOFTWARE PACKAGES AS POSSIBLE

It is difficult to learn to operate a few software packages efficiently and almost impossible to remember the differences in input formats, output formats, commands and operations with a dozen packages that you use regularly. It's generally better to buy one comprehensive software package than to piece together several packages that collectively perform the same functions.

TIP # 3: BEWARE OF FREE SOFTWARE

Free software is typically like other free products: some may be good, but most is only marginally useful. The best software in out free-enterprise system comes from people who are trying to make a buck. Good software requires an enormous amount of programming time. It's hard to find someone sufficiently motivated to produce good free software. Moreover, even if the software is good, chances are it will lack adequate documentation or manufacturer's support.

Many of the program listings published in magazines fall under the category of free applications software. But if a program is really worthwhile, the programmer houses or manufacturers. Here again, though, you'll find exceptions. Some people produce excellent programs, then publish articles on their "labors of love".

Three outstanding sources for useful free software are BYTE (for all computers; 70 Main St., Peterborough, NH 03458); Dr. Dobb's Journal (for all computers; People's Computer Company, Box E, 1263 El Camino Real, Menlo Park, CA 940225); and The Alternate Source (for TRS-80 computers; 1806 Ada St., Lansing, MI 48910).

TIP # 4: USE THE DOCUMENTATION AS A GUIDE

Poor software packages rarely have excellent documentation, and good software usually comes with substanial documentation (although it may be filled with jargon). Look over the software's manual to find out how the package works. If the manual seems to be comprehensive, the software probably works well. If the documentation is scanty, it's possible that the software is poorly orgainzed too.

In many cases you can buy the manual separately, as a preview to buying an expensive software package. The manufacturer often credits the cost of the manual to you if you later decide to purchase the software. Use this option when you can; it can save you from unpleasant surprises.

TIP # 5: BUYING PROGRAMS IN ASSEMBLY LANGUAGE

Programs written in assembly language run from dozens to hundreds of times faster than equivalent programs written in BASIC or other higher-level languages. Assembly language programs tend to take better advantage of a machine's inherent strengths. If you have a choice between an application written in BASIC and one written in assembly language, a good rule is to choose the assembly language version, all other things being equal. If you think that BASIC languages are fast enough, you haven't sat at your computer keyboard for several hours waiting for a mailing-list program to sort - a procedure that might take only five minutes in an assembly-language version. Particularly avoid applications written in "interpretive" BASIC; "compiler" BASIC or other compiler languages fall somewhere in between assemblers and interpreters.

TIP # 6: AVOID SOFTWARE THAT CANNOT BE BACKED UP

People have pirated a great deal of software and deprived many companies of their just fair profits and software author of their fair royalities. Consequently some companies ahve adopted nonstandard disk formats that you cannot backup (copy). If you use a single disk repeatedly, at some point it may very well become unreadable due to excessive handling or accidents. At that time, a manufacturer of no-backup disks tells you, "We will be happy to send you another copy for a nominal fee" - a minor inconvenience to you. But what happens if the manufacturer is no longer around? There goes your beautiful database of last year's commodities market.

If you're certain that the company you're buying the software from will be around for the next few years and if you can back up the disk at least once, then the backup problem is not very critical. However, don't buy this type of program from a small, undercapitalized garden-shop operation. The business may be well-intentioned, but you're taking a gamble!

TIP # 7: BUY SOFTWARE FROM RESPONSIVE COMPANIES

If you buy a $500 applications program or operating system, you're entitled to some answers to thorny questions or unusual problems you can't glean from the instruction manual in a reasonable amount of time.

But how much support can you expect per dollar value of software? Certainly you can hold the software manufacturer accountable for bugs in the software. You'll find, however, that some manufacturers and software houses have only a flagrant disregard even for knowledgeable users who call in with valid problems.

Some of the smallest garage-shop developers, on the other hand, are the most receptive to questions and problems. (It is obviously in their interest to foster close ties with their customers; they canot afford the attention-getting ads used by larger companies.) Be sure to choose software from responsive companies.

TIP # 8: USE A VARIETY OF EVALUATION TECHNIQUES

Even an inexpensive software package merits extensive evaluaton. The initial cost of the package is negligible compared to the time and data that you'll be investing in it if you use it frequently.

Word of mouth is probably one of the best evaluation techniques. If you belong to a local users group or computer club, check to see whether others have the program you're interested in, ask them how they like it, and check on potential problems. If you have a system with data communication capability, another good way to get independent evaluations of software is to question other computer users via electronic bulletin boards and forums available through Compuserve, The Source, and other systems.

Magazine reviews are also good sources of evaluation. We know that manufacturers advertise in magazines. And we know that advertising revenues are important to publishers. In spite of this, however, we feel that most magazines review software products objectively; in fact, some reviews may even be a little too critical solely because of the nature of critcism in general.

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you use it yourself. Don't forget: you'll be spending a great deal of time with some software applications so it's worth your while to try out the package before you buy it.

This approach, though, does have some flaws. A large software package may be so powerful that it takes a considerable amount of time to learn how to do even simple things. In such a case, you probably can't afford the time to learn a significant portion of the procedures for operating the package. And it may not be fair to ask the computer salesperson to spend hours giving you a demonstration either.

These nine tips should guide you on a successful journey through the software jungle.

PROGRAM AREA: BUSINESS ED. AND DATA PROCESSING

SCHOOL	SOFTWARE	VENDOR	HARDWARE
Rabun Co.	Typing Tutor II	The Image Producers	Apple II E
	Business Vol I	MECC	"
	Business Vol II	"	"
	Business Vol III	"	"
	Adm. Software Demo.	"	"
	Basicalc	Softalk	"
	Business Application	Apple	"
	Visicalc	Software Arts Inc.	"
	Automated Accts. for M.C.	Southwestern	"
	Word Handler II	Silicon Valley	"
	List Handler	"	"
	Quick File II	Apple	"
	Wordstar Vol I	Southwestern	"
	Wordstar Vol II	"	"
	D Base Vol I	"	"
	D Base Vol II	"	"
	Multiplan for Apple	"	"
Cherokee H.S.	Superscripsit	TRS	TRS-80 II & III
	Real Estate Analyzer	"	"
	Profile	"	"
	Visicalc		

School	Software	Vendor	Hardware
	Data Entry Acc. for M.C.	Southwestern	"
	Payroll	TRS	"
	M.C.	Southwestern	"
Hart Co.	Data Entry Activities	Southwestern	TRS-80 III
	The Micro-Editor	"	"
	Automated Acct.	"	"
	Visicalc	TRS	"
	Scripsit	"	"
	Superscripsit	"	"
	Profile III Plus	"	"
Pickens Co.	Superscripsit	TRS	TRS-80 III
Brunswick H.S	Microcomputer Acctg. Applic.	Gregg	TRS-80 3-4
	Superscripsit	Apple	TRS-80 3-4
Braxton H.S	Intro. to IBM-Pc	Southwestern	IBM-Pc
	Video Gallery	Southwestern	"
	Business Vol. I	Minnesota Ed. Computer Con.	"
	Business Vol. I Manual	MECC	"

School	Software	Vendor	Hardware
	Business Vol. II	MECC	"
	Business Vol. II Manual	MECC	"
	Automated Account for the Micro.	Southwestern	"
	Developing Editing Skills	Gregg	"
	Alphabetic Index Rules	Southwestern	"
	Data Entry Activities for the Microcomputer	"	"
	Structured Basic	"	TRS-80 IV
	Data Base Inventory	Radio Sh.	"
	Inventory Posting Drill	"	"
	Micro Activities for Office Procedures	Southwestern	"
	Micro Keyboarding	"	"
	Alphabetize	Bob Baker Software	"
Forsyth Co.	Super Scripsit	TRS	TRS-80 IV
	Applewriter II	Apple	Apple II E
	Sounds Abound	Houghton/ Mifflin	"
	List Handler	Silcon Valley	"
	Word Handler	"	"
	Spell Handler	Silcon Valley	Apple II E
	Desktop Comp.	Kendalltunt	"
	Micro Editor	Southwestern	"

School	Software	Vendor	Hardware
	Master Type	Scarborough Systems	"
	Quick File	Apple	"
Americus	Structured Basic	Southwestern	TRS-80
	Data Entry Acc. for M.C.	"	"
	Automated Acc. for M.C. (network)	"	"
	"	"	"
	Accounts Receivable Accounts Payable General Ledger Check Writer	TRS	"
East Laurans	Automated Acc.	Southwestern	TRS-80 III or IV
	Data Entry Activities	"	"
Effingham Co.	Visicalc	Personal Software	TRS-80 III
	SuperScripsit	Concept Ind.	"
	Authority System	"	"
	Test Bank	Advanced Tech. Applications	"
	Desk Top Comp. (Intro,Games,	Ronald Merchant/ Kendall/Hunt	"

School	Software	Vendor	Hardware
	& Exercuse)		
	Microcomputer Applications for the DP work kit	McGraw Hill	"
	Data Entry Activities for the M.C.	Southwestern	"
Calhoun Co H.S.	Automated Acc. for the Micro	Southwestern	Apple II E
	Micro oriented Acc.	"	"
	ACAI Approach		
	Typing Tutor	Microsoft	"
	Master Type	Lighting Software	"
	Bankstreet Writer	Braderbund Software	"
	Applewriter II	Apple	"
	Let's Explore	Milton-Bradley	"
	Word Processing		
	Punctuation: the Sentence Roadmap	Media Materials Inc.	"
	Basic Writing Compatency Program	Educational Activities Inc.	"
	Data Entry Activities for the M.C.	Southwestern	"
	Word Division	"	"

School	Software	Vendor	Hardware
Lanier Co.	SuperScripsit	TRS	TRS-80
	Microcomputer Acc. Applications	McGraw-Hill	"
	Data Entry Activities	Southwestern	"
	Structured Basic Test Diskette	"	"
	Disk Course	TRS	"
	Basic Course	"	"
	Scripsit Dictionary	"	"
	Quizer Quiz	"	"
Broxton H.S.	Wordstar	IBM	IBM P.C.
	Wordstar Training Disk	Southwestern	"
	VisiCalc	Visi Corp	"
	VisiCalc Trainer	Southwestern	"
	Micro Comp Acc.	"	"
Ogelthorpe Co.	Data Entry Activity for the Micro.	Southwestern	TRS-80 III
	Automated Acc.	"	"
	Numeric Data Entry	"	"
	Scripsit	"	"
	Inventory Control	"	"

PROGRAM AREA : ADMINISTRATION AND TEACHER SUPPORT

School	Vendor	Software	Hardware
Lumpkin Co.	Classifier (scheduling)	Mount Caster Software Corp.	Apple IIe or II (+ dual disk)
	PFS File	Apple	"
	PFS Reports	"	"
	Applewriter IIe	"	"
	Quickfile	"	"
	Visicalc	"	"
	Logo	"	"
	Superpilot	"	"
(Also use over 100 other programs for all areas of instruction)			
East Laurens Comp.H.S.	Aids-III version 2.0	Softrends, Inc.	TRS-80
Claxton H.S.	Structured Basic	Southwestern	TRS-80 III/IV
	D B Master	Stoneware	Apple
	PFS File	Apple	"
Effingham Co.	Profile	TRS	TRS mod 12 2 disc
	Visicale	Personal Software	"
	General Ledger	TRS	"
	Scripsit	"	"

School	Software	Vendor	Hardware
Rockmart	Profile Plus	TRS	TRS-80 IV
Evans H.S. (Columbia Co.)	Author I	TRS	TRS-80 I, III,IV
	Gradekeeper	Random House	TRS-80 III,IV
	Quick Quiz	TRS	"
	Wordsearch	Office of Res. & Sev. Ga. Dept. of Ed.	"
	Register Helper	"	"
	Grade Averager	"	"
Riverdale H.S.	Bankstreet writer	Apple	Apple IIE
	Quick File	"	"
Forest Park H.S.	PFS File	Software Pub. Corp.	Apple IIE
	PFS Report	"	"
	Quick File	"	"
McIntosh	KMan	Micro Data Base System	IBM-PCXT (harddisc)
Bacon Co.	PFS File	Software Pub.	Apple II E
	PFS Reports	"	"

School	Software	Vendor	Hardware
Calhoun City	Scheduling Teacher Utility	Hart Ga. Dept. of Education	TRS-80 IV "
Americus	School Adm. Program	Bernard Tschiderer (Mitchell-Baker H.S.)	TRS-80 IV
Gwinnett Ctr. (Parkview)	E Z Ledger School Forms	Apple	Apple II E "
	Apple presents Apple	Apple	"
Gwinnett Ctr. (Parkview)	Applesoft Sampler	Apple	Apple II E
	Dros.	"	"
	MECC Demo 3.6	MECC	"
	Gwinnett Testing Prog.		"
	MECC Demo 1.1	MECC	"
	Quickfile	Apple	"
	Applewriter	"	"
Cherokee Co. H.S.	Quick Quiz	TRS	TRS-80 III or IV
	Gradekeeper	Bertamax	"
	Superscripsit	TRS	"
	Author's System for CAI	"	"
	Apple Guidebook	J & T Software	Apple II E

School	Software	Vendor	Software
	PFS File	Apple	"
	Visicalc Electronic Worksheet	Visicorp	"
	Applewriter	Apple	"
Decab OEC South	Applewriter II	Apple	Apple II E
	Quickfile II	"	"
	Student	Ga. Dept. of Educ.	Apple II

PROGRAM AREA : HOME ECONOMICS

School	Software	Vendor	Hardware
Effingham Co.	Visicalc	Visicorp	Apple II E
	PFS File	Software Publishing	"
	Applewriter II	Apple	"
	Eat Smart	Pillsbury Co.	"
Madison Co.	Nutrition Vol. I Vers 1.1	MECC	Apple II E
	Consumer Econ	"	"
	HEC 101		
	Applewriter		
	Visicalc		
	PFS File		
Ogelthorpe Co.	Eat Smart	Pillsbury Co.	Apple II E
	Applewriter	Apple Comp Inc.	"
	PFS File	Software Pub. Inc.	"
	Viseal	Visicorp	"
Brunswick H.S.	Micro Acc.		
	Fast Food	Learning Seed Co.	Apple II E
	Snack Master	"	"

PROGRAM AREA : HEALTH OCCUPATIONS

School	Software	Vendor	Hardware
Ogelthorpe Co.	Heart Lab	Educational Act. Inc.	TRS-80
	Your Body Series I	Bedsley Cordy's	"
	Your Body Series II	"	"
	Respiration	"	"
	Digestion	"	"
	Locornation	"	"

PROGRAM AREA : MDE

School	Software	Vendor	Hardware
Brooks Co.	Dow Jones Market Anal.	Career Aids Inc.	TRS-80
	Dow Jones Market Manager	"	"

PROGRAM AREA : INDUSTRIAL ARTS

School	Software	Vendor	Hardware
Effingham Co.	Iowa Handbook of Basic Comp. Prog. for Ind. Arts	Iowa Dept. of Educ.	Apple II E or the TRS-80 III
Forsyth Co.	Desk Top Comp.	Kendall Hunt	TRS-80 III
	SuperScripsit	TRS	"
	General Ledger	"	"
	Visicalc	"	"
	Mailing List	"	"
	Profile	"	"
	Accounts Payable	"	"
Cherokee H.S.	Board Feet		TRS-80 III or IV

PROGRAM AREA : CVAE

School	Software	Vendor	Hardware
Cherokee H.S.	Scholastic Spelling 3	TI	TI
	Multiplication	"	"
	Beginning Grammar	"	"
	Number Magic	"	"
	Teach Yourself Basic	"	"
	Challengers	"	"
Cedartown	Math Related (Add,Subt., Division, and word problems)	Cliff Rice & Assoc.	TRS-80 III
	English Related (nouns,pronouns, adverbs,verbs, verb terms, verb terms, prepositions, and pucntuation)	Aquarius	"
	Employability Skills	"	"

PROGRAM AREA : PECE

School	Software	Vendor	Hardware
Cherokee H.S.	Resources for Job - Hunting	Micro Ed. Prog.	Apple II E
	Job Readiness Attitude Assessment	"	"
	Filling out Job Applications	"	"
	Successful Job Interviews	"	"
	Career Scan IV	"	"

PROGRAM AREA : RVI

School	Software	Vendor	Software
Cherokee	Caterpillar	Micro Educ. Prog.	Apple
	Masterword	Victory Software	"
	Identifying Complete Sent.	Micro Educ. Prog.	"
	Bell Dinger	"	"
	Tutti-Frutti	"	"

WINNING PRODUCTS FOR THE WORLD CLASS PC CONTEST

CATEGORY	PRODUCT	MANUFACTURER
Accounting	1. Peachtree's Business Accounting Software	MSA, Inc. 3445 Peachtree Rd. NE Atlanta, GA 30326 404/239-3000 List price: each model $595, 8 models $4760
	2. BPI Systems Business Accounting Software	BPI Systems
	3. Easy Business Accounting Series	Sorcim Corp.-I.U.S.
	4. Desktop Accountant	Rocky Mountain Software Systems
	5. Hardisk Accounting Series	Greater Plains Software
	6. Open Systems Accounting Software	Open Systems
Business Management	1. Harvard Project Manager	Harvard Software, Inc. 521 Great Rd. Littleton, MA 01460 617/486-8431 List price: $395
	2. Time Accountant	Time Accountant

CATEGORY	PRODUCT	MANUFACTURER
Business Management	3. Project Scheduler	SCITOR Corp.
	4. Decision - Anlayst	Executive Software, Inc.
	5. Starpac	Walonick Associates
	6. Prospecting	Key Systems, Inc.
Financial Applications	1. Dow Jones Investment Evaluator	Dow Jones & Co. P.O. Box 300 Princeton, NJ 08540 800/257-5114 List price: $149
	2. Micro/Prophit	Via Computer, Inc.
	3. Tax Preparer	Howard Software Services
Personal Management	1. The Home Accountant Plus	Arrays, Inc./ Continental Software 11223 S. Hindry Ave. 213/410-3977 List price: $150
	2. Personal Computer/ Personal Finance	Best Programs, Inc.
	3. Dollars and $ense	Monogram
	4. Financier II	Financier, Inc.

CATEGORY	PRODUCT	MANUFACTURER
Education	1. ATI's Training Power Series	American Training International 12638 Beatrice St. Los Angeles, CA 90045 213/823-1129 List price: $379.90 for six ($39.95 for first 2 on list: $75 each for last 4)
	2. Spinnaker Educational Games	Spinnaker Software Corp.
	3. Instructor	Individual Software, Inc.
	4. PLATO Microlink	Control Data Publishing
	5. MasterType	Scarborough Systems
Disk Emulator	1. SuperDrive	AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 714/836-1333 List price: $45 for SuperPac (SuperDrive and SuperSpool)
	2. QuadRAM Drive	Quadram Corp.
	3. JFormat	Tall Tree Systems
	4. SpeedDisk	Tecmar, Inc.

CATEGORY	PRODUCT	MANUFACTURER
Spreadsheet	1. 1-2-3	Lotus Development Corp. 161 First St. Cambridge, MA 02142 617/492-7171 List price: $495
	2. Multiplan	Microsoft
	3. SuperCalc 1, 2, and 3	Sorcim Corp.
	4. VisiCalc	VisiCorp
	5. Open Access	Software Products International
	6. Perfect Calc	Perfect Software
	7. MBA	Context Management Systems
Data Base - Major	1. dBASE II	Ashton - Tate 10150 W. Jefferson Blvd. Culver City, CA 90230 213/204-5570 List price: $495
	2. R:base 4000	MicroRim, Inc.
	3. Knowledge Man	Micro Data Base Systems, Inc.
	4. Data Base II Manager	Alpha Software Corp.
	5. Revelation	Cosmos, Inc.
	6. Power-base	GMS Systems, Inc.
	7. InfoStar	MicroPro International Corp.

CATEGORY	PRODUCT	MANUFACTURER
Word Processing	1. WordStar	MicroPro International Corp. 33 San Pablo Ave. San Rafael, CA 94903 415/499-1200 List price: $495
	2. Microsoft Word	Microsoft Corp.
	3. MultiMate	Softword Systems, Inc.
	4. Volkswriter Deluxe	Lifetree Software, Inc.
	5. WordPerfect	Satellite Software International
	6. Easy Writer II	Sorcim Corp./I.U.S.
	7. Perfect Writer	Perfect Software
Communications	1. Smartcom II	Hayes Microcomputer Products, Inc. 5923 Peachtree Industrial Blvd. Norcross, GA 30092 404/449-8791 List price: $149
	2. Crosstalk XVI	Microstuf, Inc.
	3. PC - Talk III	The Headlands Press, Inc.
	4. Perfect Link	Perfect Software

CATEGORY	PRODUCT	MANUFACTURER
Graphics	1. pfs:file	Software Publishing Corp. 1901 Landings Dr. Mountain View, CA 94043 415/962-8910 List price: $140
	2. PC-File	Jim Button
	3. 1-2-3	Lotus Development Corp.
	4. Friday	Ashton-Tate
	5. VisiFile	VisiCorp
	6. Perfect Filer	Perfect Software
Data Base - Index File	1. 1-2-3	Lotus Development Corp. 161 First St. Cambridge, MA 02142 617/492-7171 List price: $495
	2. Fast Graphs	Innovative Software, Inc.
	3. Energraphics	Enertronics Research, Inc.
	4. AutoCAD	Autodesk, Inc.
	5. Chart-Master	Decision Resources
	6. Chartman	Graphic Software, Inc.
	7. PC-Draw	Micrografx

CATEGORY	PRODUCT	MANUFACTURER
Games	1. Microsoft Flight Simulator	Microsoft Corp. 10700 Northup Way Bellevue, WA 98004 206/828-8080 List price: $49.95
	2. Zork I,II, and III	Infocom, Inc.
	3. PC Arcade	FriendlySoft, Inc.
	4. Decathlon	Microsoft Corp.
	5. Millionaire	Blue Chip Software
	6. Nightmission Pinball	Sublogic Communications Corp.
	7. Cosmic Crusader	Funtastic, Inc
	8. Starcross	Infocom, Inc.
	9. Frogger	Sierra On-Line, Inc.
	10. Ultima II	Sierra On-Line, Inc.
	11. Deadline	Infocom, Inc.
Terminal Emulator	1. IRMA	Digital Communications Associations, Inc. 303 Technology Park Norcross, GA 30092 404/448-1400 List price: $1195
	2. SmarTerm/PC	Persoft, Inc.
	3. IBM 3101 Emulation	IBM
	4. VTERM	Coefficient Systems Corp.

CATEGORY	PRODUCTS	MANUFACTURER
Utilities	1. Norton Utilities	Peter Norton 2210 Wilshire Blvd. Santa Monica, CA 90403 213/399-3948 List price: $80
	2. ProKey	RoseSoft, Inc.
	3. Copy II PC	Central Point Software, Inc.
	4. Sideways	Funk Software
	5. Pascal Tools	Blaise Computing, Inc.
	6. Disk Mechanic	MLI Microsystems
Language	1. IBM BASIC	IBM Entry System Division P.O. Box 1328 Boca Raton, FL 33432 800/447-4700 List price: included in purchase price of IBM PC
	2. Dr. Logo	Digital Research
	3. Microsoft Pascal	Microsoft Corp.
	4. BASIC Compiler	Microsoft Corp.
	5. Lattice C Compiler	Lifeboat Associates
	6. Turbo Pascal	Borland International
	7. FORTRAN Compiler	Microsoft Corp.
	8. Microsoft C Compiler	Microsoft Corp.

CATEGORY	PRODUCT	MANUFACTURER
Language	9. Pascal Compiler	IBM
	10. Pascal/MT + 86	Digital Research
Operating System	1. PC - DOS 210	IBM Entry Systems Division P.O. Box 1328 Boca Raton, FL 33432 800/447-4700 List price: $65
	2. MS-DOS 1.25	Microsoft Corp.
	3. CP/M- 86	Digital Research
	4. UCSD p-System	IBM
	5. Coherent	M

Microcomputer Software Publishers for
Vocational subject areas

Abraxas
550 E. 40th St.
Eugene, OR 97440
(503) 485-6747

Academy Software
P.O. Box 6277
San Rafael, CA 81301
(303) 247-8738

Agricultrual Software
Consultants, Inc.
1706 Santa Fe
Kingsville, TX 73863
(512) 595-1937

Alkazar Associates
2638 S. Lynn St.
Arlington, VA 22202

Alpha Bit
Communications, Inc.
Rm. 202
13349 Michigan Ave.
Dearborn, MI 48126
(313) 581-7896

Applied MicroSystems,
Inc.
P.O. Box 832
Roswell, GA 30077
(404) 475-0832

Aquarius
P.O. Box 128
Indian Rocks Beach,
FL 33535
(813) 595 7890

Area Cooperative
Educational Services
School Services Unit
295 Mill Rd.
North Haven, CT 06473
(203) 234-0130

Avalon Hill
Microcomputer Games
4571 Hartford Rd.
Baltimore, MD 21214
(301) 254-9200
(800) 638-9292

Barron Enterprises
714 Willow Glen Rd.
Santa Barbara, CA 93105
(805) 687-5873

Behavioral Engineering
230 Mt. Hermon Rd., # 207
Scotts Valley, CA 95066

Bergwall, Inc.
P.O. Box 238
Garden City, NY 11530
(516) 222-1111
(800) 645-3565

BIOCAL Software, Inc.
167 Wilson St.
Petaluma, CA 94952
(707) 763-4348

BLS, Inc.
2503 Fairlee Rd.
Wilmington, DE 19810
(800) 545-7766

Bluebirds Computer
Software
2267 23rd St.
P.O. Box 339
Wyandotte, MI 48192

BPS, Inc.
143 Binney St.
Cambridge, MA 02142
(617) 686-6565
(800) 342-5277

Brantex, Inc.
Color Software
Services Div.
P.O. Box 1708
Greenville, TX 75401
(214) 454-3674

Brodhead-Garrett Co.
4560 E. 71st St.
Cleveland, OH 44105
(800) 321-6730
(800) 362-8915 (in Ohio)

Bytes & Pieces
P.O. Box 525
East Setaukey, NY 11733
(516) 751-2535

Career Publishing, Inc.
936 N. Main St.
P.O. Box 5486
Orange, CA 92667
(800) 854-4014
(800) 821-0543

CBS Software
1 Fawcett Pl.
Greenwich, CT 06836
(203) 622-2500

Classroom Consortia
Media, Inc.
57 Bay St.
Staten Island, NY 10301
(212) 447-2600

C Load Magazine
924 Anacapa # B1
P.O. Box 1448
Santa Barbara, CA 93102
(805) 962-6271
(800) 621-6240

Commodore International
1200 Wilson Dr.
West Chester, PA 19380
(215) 434-9100

Comprep Corp.
P.O. Box 6387
Orange, CA 92667
(714) 997-2989

Compu-tations, Inc.
P.O. Box 502
Troy, MI 48099
(313) 689-5059

Computer Library
3225 Danny Park
New Orleans, LA 70002
(504) 455-5330

Computer Publishing, Inc.
5900 Cassandra Smith Rd.
Hixson, TN 37343
(615) 842-4600

The Conover Co., Ltd.
P.O. Box 155
Omro, WI 54963
(414) 685-5707

Continental Software
11223 S. Hindry Ave.
Los Angeles, CA 90045
(213) 410-3977

Educational Audio
Visual, Inc.
19 Marble Ave.
Pleasantville, NY 10570
(914) 769-6332

EMC Publishing
300 York Ave.
Saint Paul, MN 55101
(612) 771-1555
(800) 328-1452

Encyclopedia Britannica
Educational Corp.
425 N. Michigan Ave.
Chicago, IL 60611
(404) 257-1690
(800) 554-9862

Ex-Ed Technologies Corp.
71-11 112th St.
Forest Hills, NY 11375
(212) 268-0020
(800) 222-3933

M. D. Fullmer & Assoc.
1132 Via Jose
San Jose, CA 95120
(408) 997-1154

J. L. Hammett Co., Inc.
Microcomputer Div.
Hammett Pl.
Braintree, MA 02184
(617) 848-1000

Harvard Associates, Inc.
260 Beacon St.
Somerville, MA 02143
(617) 492-0660

Hayden Software Co.
600 Suffolk St.
Lowell, MA 01853

Hoyle and Hoyle Software
716 S. Elam Ave.
Greensboro, NC 27403
(919) 378-1050

H.U.M.A.N.S., Inc.
P.O. Box 352
Sterling, VA 22170
(804) 525-3341
(800) 368-3238
(800) 542-2242

Indiana Biolab
Box 407, RR#2
Palmyra, IN 47164
(812) 364-6739

Innovative Programming
Associates, Inc.
1 Airport Pl.
Princeton, NJ 08540
(609) 924-7272

Intellecual Software
798 North Ave.
Bridgeport, CT 06606
(203) 335-0906
(800) 232-2224

JAC Software
76 N. Weston Ave.
Elgin, IL 60120
(312) 741-3555

Jagdstaffel Software
645 Brenda Lee Dr.
San Jose, CA 95123
(408) 578-1643

Jini Micro Systems, Inc.
Kingsbridge Station
P.O. Box 274
Riverdale, NY 10463

J.P. Programs
852 Kallas Ct.
Valley Stream, NY 11580
(516) 825-2132

Kensington Microware, Ltd.
251 Pard Ave. South
New York, NY 10010
(212) 475-5200

Learning Software
33611 Oakland
Farmington, MI 48024
(313) 478-4937

M & R Enterprises
910 George St.
Santa Clara, CA 95050
(408) 980-0160

Mark of the Unicorn, Inc.
222 Third St.
Cambridge, MA 02142
(617) 576-2760

Mayday Software
Rock Creek Rd.
P.O. Box 66
Phillips, WI 54555
(715) 339-3966

MCE, Inc.
Suite 250
157 S. Kalamazoo Mall
(616) 345-8681

Media Materials, Inc.
2936 Remington Ave.
Baltimore, MD 21211
(301) 235-1700
(800) 638-1010

Metasoft Corp.
Suite 12
6509 W. Frye Rd.
Chandler, AZ 85224
(602) 961-0003

Metro West Center, G.L.R.S.
2268 Adams Dr. N.W.
Atlanta, GA 30318
(404) 352-2697

MFJ Enterprises, Inc.
921 Louisville Rd.
Starkville, MS 39759
(800) 647-1800

Micro-Art Programmers
173 Birch Ave.
Cayucos, CA 93430
(805) 995-2329

Micro Learningware
Hwy. 66 South
P.O. Box 3427
Mankato, MN 56001
(507) 625-2205

Micro Software
International
The Silk Mill
44 Oak St.
Newton Upper Falls, MA
02164
(617) 527-7510

Micro-Sparc, Inc.
10 Lewis St.
Lincoln, MA 01773
(617) 259-9710

Midwest Software
Associates, Inc.
1160 Appleseed Ln.
Saint Louis, MO 63122
(314) 997-6470

Mind Systems Corp.
P.O. Box 506
Northampton, MA 01061
(413) 586-6463

Minnesota Educational
Computing Consortium (MECC)
3490 Lexington Ave. North
Saint Paul, MN 55112
(612) 481-3500

Morgan Computing Co., Inc.
Suite 210
10400 N. Central Expy.
Dallas, TX 75231
(214) 739-5895

MUSE Software
347 N. Charles St.
Baltimore, MD 21201
(301) 659-7212

National Center for Research
in Vocational Education
Ohio State University
1960 Kenny Rd.
Columbus, OH 43210
(614) 486-3655

Nibble
P.O. Box 325
Lincoln, MA 01773

Nonagon Software
11185 San Pablo Ave.
P.O. Box 1846
El Cerrito, CA 94530
(415) 237-4406
(800) 942-2058

Orange Juice Software
Systems
222 S. Washington Ave.
New Richmond, WI 54017
(715) 246-3588

PCD Systems
P.O. Box 277
Penn Yan, NY 14527
(315) 536-7428

PC Software Interest
Group
2544 Swan Blvd.
Milwaukee, WI 53226
(800) 251-8407

Pillsbury Co.
Pillsbury Center
Mail Station 3286
Minneapolis, MN 55402

Pioneer Software
1746 N.W. 55th Ave., #204
Lauderhill, FL 33313
(305) 739-2071

PMI, Inc.
P.O. Box 87
Buckfield, ME 04220
(207) 336-2500

Prosoft
P.O. Box 560
North Hollywood, CA 91603
(818) 764-3131

Queue, Inc.
5 Chapel Hill Dr.
Fairfield, CT 06432
(203) 335-0908
(800) 232-2224

School & Home Courseware, Inc.
Suite C
1341 Bulldog Ln.
Fresno, CA 93710
(209) 227-4341

Science Research Associates, Inc. (SRA)
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Sierra On-Line, Inc.
Sierra On-Line Bldg.
Coarsegold, CA 93614
(209) 683-6858

Simtek Business Games
P.O. Box 109
Cambridge, MA 02139
(617) 369-5538

Singer Career Systems
80 Commerce Dr.
Rochester, NY 14623
(716) 334-8080

Skyles Electric Works
231E S. Whisman Rd.
Mountain View, CA 94041
(415) 965-1735
(800) 227-9998

Softshoppe II
P.O. Box 5223
Mesa, AZ 85201
(602) 833-3705

South Bay Word Processing
Suite 290
1558 Oro Vista Rd.
San Diego, CA 92154
(619) 575-8381

Special Soft
P.O. Box 1983
Santa Monica, CA 90406
(213) 395-7466

Spectravideo, Inc.
45 S. Service Rd.
Plainview, NY 11803
(516) 420-6990

Sterling Swift
Publishing Co.
7901 South IH 35
Austin, TX 78744
(512) 282-6840

Sunbelt Computing
7807 Kenosha
Lubbock, TX 79409
(806) 792-6508

SWI International
Systems
Suite 2
7741 E. Gray Rd.
Scottsdale, AZ 85260
(602) 998-3986

Synoptic Software
57 Reservoir Ln.
Chestnut Hill, MA 02167
(617) 727-0778

Tab Books, Inc.
Monterey Ave.
Blue Ridge Summit, PA
17214
(717) 794-2191
(800) 233-1128

Tandy Corp./Radio Shack
1400 One Tandy Center
Fort Worth, TX 76102
(817) 390-3832
(800) 433-5682
(800) 772-8538 (in Tex.)

Taylormade Software
7300 Candletree Ln., #24
P.O. Box 5574
Lincoln, NE 68505
(408) 488-0196

Teaching Pathways, Inc.
121 E. Second Ave.
Amarillo, TX 79101
(806) 373-1847

Wadsworth Electronic
Publishing Co.
10 Davis Dr.
Belmont, CA 94002
(415) 595-2350
(800) 831-6996

Western Wares
Box C
Norwood, CO 81423
(303) 327-4898

Zephyr Services
306 S. Homewood Ave.
Pittsburg, PA 15208
(412) 247-5915

Ziff-Davis
1 Park Ave.
New York, NY 10016
(212) 725-3500

Zypcom
P.O. Box 3421
Boise, ID 83703
(208) 345-2387

TYPICAL SOFTWARE FOR PROGRAM AREAS

We have listed typical software that may be purchased for various vocational subject areas.

This list is by no means comprehensive, nor is it intended to be an endorsement or recommendation of the programs listed.

These are merely examples of the kind of software that is being produced along with the price and vendor description.

You are encouraged to contact the vendors we have listed for their complete catalogs and to contact the Macon Computer Center for a listing of their materials.

AGRICULTURE SOFTWARE

Agricultural Math Tutor
Teaching Aids, Inc.
P.O. Box 1798
Costa Mesa, Calif.
92626-0798
Offers practical problems in farm management, takes students step by step in finding answers.
Apple II, II+, and IIe
Disk. $27.00

Hang Farmer
Teaching Aids, Inc.
P.O. Box 1798
Costa Mesa, Calif.
92626-0798
Fun way to learn ag science, ag mechanics, horticulture, and foresting vocabulary. Instructor provides words and definition, computer tabulates scores, giving class grade sheet.
Apple II+ Disk.
$29.00

Agri-Quiz Series
Agri-Farm Publications, Inc.
1019 Market Street
Gowrie, Iowa 50543
A computer quiz program which allows the teacher to quiz students on parliamentary procedure, soils, crop production, corn management, farm management, nursery/ landscapes, floriculture, small grain, dairy production, and FFA instruction. It will also print random tests form its base of questions.
Apple Disk for II and III.
$50.00

Hort-Plant
Ohio Agricultural Education
2120 Fyffe Rd., Room 254
Columbus, Ohio 43210-1099
A tutorial program that assists students with learning the parts of a plant.
Apple II Disk.
$29.00

Computer Modules for
Business Education
Career Aids, Inc.
8950 Lurling Ave.,
Department J 9
Chatsworth, Calif. 91311

These computer programs present typical computer applications in business. Each module runs for 25 - 40 minutes and 1 disk. These modules run on the Apple II or IIE, 48K, DOS 3.3 Includes Business Applications, Uses of a Database, Business Forecasting, Computer Simulation, Statistics. Set of 5 modules.
$175.00

pfs: Write
Dean Karrel
Prentice-Hall, Inc.
General Publishing Division
Englewood Cliffs, NJ 07632

pfs: Write is a word processing program that is both uncomplicated and powerful, providing the power of a word processor with the simplicity of a typewriter. The program produces error-free documents quickly, allows the computer to function as an electronic notepad, and displays the document on the screen in its print format. Its features include boldfacing, underlining, centering, justifi

BUSINESS SOFTWARE

Data Base Manager II
Dean Karrel
Prentice-Hall, Inc.
General Publishing Division
Englewood Cliffs, NJ 07632

Data Base Manager II is a file management system that enables the user to maintain data in an organized, accessible, and accurate manner. The program provides powerful sort and five-level search capabilities, report formats, mail merge eatures, and the ability to create customized screens for data entry and viewing. The program employs a unique Data Exchange Format (DEX) which allows tht integration of information downloaded form a mainframe or minicomputer. Data Base Manager II interacts with most leading wordprocessors and spreadsheet programs.
Teachers pack $24.95
Student workbook $14.95

EasyBusiness Systems
General Ledger
Dean Karrel

EasyBusiness Systems General Ledger with Financial Reporter enables the user to maintain general ledger accounts and produce custom reports with headings and text. The program supports up to twenty-four months of historical data and twelve months of budget projections. The user can prepare monthly, quarterly, semi-annual, annual, or year-to-date statements of revenue and expense accounts, plus comparisons to budget, and prior/corresponding periods of the previous fiscal year. EasyBusiness Systems modules.
Teachers pack $19.95
Student workbook $14.95

Jack2
Dean Karrel
Prentice-Hall, Inc.
General Publishing Division
Englewood Cliffs, NJ 07632
Jack2 is an integrated software package that offers word processing, data base management, charting, and spreadsheet capabilities, allowing all functions to be used simutaneously on the smae screen. The user can work with all functions within one document without the use of windowing techniques. Jack2 will print the image created by the user, word for word, figure by figure, or column by column.
Teachers pack $29.95
Students workbook $14.95

Dollars & $ense
Prentice-Hall, Inc.
Dollars and Sense is a financial management software program designed to assist the user in organizing personal and small business finances. The program supports entering transactions, establishing and maintaining budgets, capturing information for year-end tax preparation,and maintains a complete set of reports and graphs that are updated immediately upon entering transactions. Dollars and Sense provides check writing capability, automatic posting, and supports the maintenance of 100 accounts.
Teachers Pack $29.95
Students workbook $14.95

MultiMate 256
Dean Karrel
Prentice-Hall, Inc.
General Publishing Division
Englewood Cliffs, NJ 07632

MultiMate 256 word processor brings the features and functions of a dedicated word processor to the IBM PC. The program accesses over one hundred features and functions one or two keystrokes and provides on-screen help and file conversion capabilities. MultiMate 256 includes Mailmerge and macros for frequently used phrases.
Teachers pack $19.95
Student workbook $14.95

dBase II
Dean Karrel

dBase II is a relational data base program that offers full data base management features and permits the creation of specific applications through using its programming capabilities. The program allows the user to create and update files, generate reports, and create applications complete with formatted entry and output. dBase II is compatible with most CP/M and MS/DOS programs, including Friday, Framework, WordStar, and Lotus 1-2-3.
Teachers pack $19.95
Students workbook $14.95

SuperCalc 3
Prentice-Hall, Inc.
General Publishing Division
Englewood Cliffs, NJ 07632
SuperCalc 3 is a highly Sophisticated electronic spreadsheet that is an expanded and enhanced version of SuperCalc and SuperCalc II. In addition to offering new financial functions such as internal rate of return, payments, present and future values, and data search and extraction, SuperCalc 3 produces high-resolution integrated presentation quality graphics. The program provides extensive formatting options, advanced memory manager, plus an extensive list of features.

CONSTRUCTION CLUSTER SOFTWARE

Building Materials Costs
Career Aids, Inc.
20417 Nordhoff Ave.,
Department Z 9
Chatsworth, CA 91311
(818) 341-8200

This three part program help students learn to figure the costs of various building materials such as pipe, steel, plywood, lumber, molding, and other such materials.
Apple II or IIe, 32K or TRS-80, Model III or 4, 32K, $39.95

Stationary Woodworking Equipment: Safety and Operations
Career Aids, Inc.

This program covers the parts, safety, and operations of the ten types of stationary equipment used in the woodworking ship. Individuals students can be safety trained and their progress tested, saving valuable time.
Apple II or IIe, or TRS-80 Modell III or 4, 32K $139.95

Estinating Materials in Masonry
Career Aids, Inc.

Students receive masonry experience without ever leaving the classroom. This informative program teaches students about courses, allowing for windows and doors, and the mathematical processes involved in masonyr. Two tests enable students to apply what learn.
Apple II or IIe, 48K
$42.45

Reviews in Building Trades
Career Aids, Inc.

These programs contain approxamately 400 tests and review questions about building construction including selection of materials, tools, fasteners and safety.
Apple II or IIe, 48K
$29.50

DRAFTING SOFTWARE

Hi-Res Architectural Design
Career Aids, Inc.
8950 Lurline Ave.
Chatsworth, CA 91311
Your students learn the basics of designing buildings with this computer program. Designed for Apple II or IIe, 48K $29.95

Blueprint Reading
Career Aids, Inc.
This complete program teaches your students beginning blueprint reading for carpentry, machine shop, drafting industrial education and welding trades. Students interactively learn vocabulary, orthographic projection, and isometrics.

Versawriter
Versawriter is an invaluable tool for drafting students as they learn how drawn images can be transferred to the computer screen, changed, modified or saved for future use. Drawings may be printed on the Epson MX80 printer with Graftrax or the IBM dot matrix printer. Versawriter plugs into the game paddle adapter's connector. Designed for the Apple II or IIe (48K) or the IBM PC (64K). $299.00
Career Aids, Inc.

Robcat
Industrial Robot Simulation
This program provides a unique opportunity to learn about robotics on the computer. The fundamentals of industrial robots are discussed and simulations of an industrial robot doing real world applications like machine loading/unloading, palletizing, vision inspection, and spot welding are presented. Designed for the TRS-80 Model III (16K) or the Commodore 64 (64K). $28.00

Robot Probe
Students learn to talk a robot's unique language and to think logically to complete a specific task - programming the robot to pick up probes, load them into the module and blast off. Designed for the TRS-80 Model III or 4 (48K). $49.00

ELECTRONICS SOFTWARE

Basic Electricity and Electronics for Direct Current
Bergwall Productions
P.O. Box 238
Garden City, New York 11530
This tutorial program is designed for first year students in basic electricity and electronics. Package includes diskettes and courseware guide. Software designed for Apple II plus 48k computer.

Mathmatics for Electronics
Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
Mathmatical operations needed for use in the electronics program are explained in this 16 program package. (Dorsett Filmstrip series has been adapted to the computer.) Atari hardware $95, Apple hardware $230.

Industrial Solid State Electronics

Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
Contains 16 programs that explain the basics of solid state electronics. (Dorsett Filmstrip series has been adapted to the computer.) Atari hardware $95, Apple hardware $230.

Circuit Analysis Program
Career Aids, Inc.
20417 Nordhoff Ave.
Department Z 9
Chatsworth, CA 91311
This is an easy-to-use electronic design program. Designed for the TRS-80 Model I, III or 4, 32K
$29.95

GRAPHIC ARTS SOFTWARE

Hi-Res Graphics and
Architectural Design
Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
This program introduces step-by-step architectural designs, colors, patterns, graphs, and flow plans. Books and user's manual included.

Koala Pad Touch Tablet with
Micro Illustrator
Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
A software program that allows the student to easily create graphics. Students can draw, color, enlarge, load, and store functions. Designed for Apple Atari, and Commodor 64.

Experiments in Human Physiology
Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
This software program provides actual measurement of physical responses, heart rate, respiration rate, skin temperature, and response time. 75 page teachers guide experiments, student data sheets, and lab equipment are provided. Designed for Apple Computers. $249.00

Micorcomputer Applications In Vocational Education: Health Occupations
Curriculm Publications Clearinghouse
46 Horrabin Hall
MaComb, Illinois 61455
A series of programs designed to demonstrate the use of the microcomputer in the health occupations area. Designed for TRS-80 model 3 DOS $12, Apple II DOS 48k $8.

Health Awareness Game
Cliffe Rice & Associates
P.O. Box 333
Cleveland, Georgia 30528
This program includes 5 health topics: Coranary risks, Why do you smoke? Exercise weight, Life Expectancy, and Lifestyle. Designed for Apple 48K, 1 Disk Drive. Includes Disk, Instructor Guide. $114.00

Maintaining Lifestyles:
Survival Math Skills
Cliffe Rice & Associates
P.O. 333
Cleveland, Georgia 30528
Program includes 3 simulations which strengthen basic math skills through involvement in daily life situations. Topics covered are the Calorie Counter, Comparison Shopping, and Budget for Success. Designed for Apple with Teacher's Guide and Worksheets. $49.00

Micro Cookbook
The Joy of Computerized Cooking
Career Aids, Inc.
20417 Nordhoff Ave.
Department Z 9
Chatsworth, CA 91311
This computer program will help you plan the foods needed for parties, meals, and shopping lists while allowing you to compile your own cookbooks. Designed for Apple II or IIe, 48K or IBM PC, 64K. $40.00

What Did You Eat Yesterday?
Career Aids, Inc.
This computer program is a fun way to learn how to achieve a well-balanced diet. Students enter what they consumed the day before and the computer calculates each students' nutritional needs and analyzes the diet entered for calories. Designed for Apple II or IIe, at 48K, and the TRS-80 Model III or 4 at 32K. $39.00

Place Setting, Meal Service & Table Manners
This interactive computer program enables students to practice setting the table and serving meals using a colorful graphics screen. 3 Disks, Practice Exercises, Documentation. Designed for Apple II or IIe, 48K $95.00

Menu Planner
This computer program makes it easy to plan meals and prepare shopping lists. Designed for the Apple II or IIe, 48K $35.00

Babysitter's Manual
Career Aids, Inc.
20417 Nordhoff Ave.
Chatsworth, Ca 91311
A well-written, comprehensive guide for babysitters. this computer program covers accident prevention and safety, seeking aid after an injury occurs, and how to care for infants and older children. Designed for Apple II or IIe and the IBM PC, 64K $34.95

New Baby Care
Career Aids, Inc.
This motivational computer program covers various areas of caring for young babies including: diet and feeding, hygiene - bathing and skin care, and sleeping habits. Designed for Apple II or IIe at 48K and IBM PC at 64K. $34.95

The Pattern Layout Simulator
Career Aids, Inc.
The objective of this program is to teach beginning sewers how to lay out patterns and cut the material so that it matches the layout worksheets. Designed for Apple II or IIe, 48K. $55.00

The Computer Guide to Fashion Careers
Career Aids, Inc.

Design Elements and Principles
Career Aids, Inc.
Students learn about the basic concepts and elements associated with color, the color wheel, and textures. Designed for Apple II or IIe 48K $150.00

Radial Arm Saw and
Table Saw Safety
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
Radial Arm Saw includes description of standard adjustments, position of arms and hands; a total 15 specific safety precautions plus 25 safety rules specific to the Table Saw. Designed for Apple II Plus and Apple IIE Computers. $68.00

Drill Press, Grinder and
Disk Sander Safety
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
This Drill Press section includes Condition of Bits, Correct Drill Speed, Use of Clamps, Use of Chuck Key, Position of Hands. Grinder Section includes Condition of Wheel, Use of Safety Shield, and Position of Body. Designed for Apple II Plus and, Apple IIE Computers. $68.00

Basic Woodshop Safety
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
Covers correct clothing protective clothing, safe shop conditions, general tool and machine use, and safe machine conditions. The intent is to qualify the student for beginning work in the shop. Designed for Apple II+ and IIE.
$68.00

METALWORKING CLUSTER SOFTWARE

Basic Welding Shop Safety
Capital Area Career Center (CRI)
611 Hagadorn Road
Mason, Michigan 48854
Covers proper clothing, protective clothing, safe shop conditions, safe use of tools and equipment, and basic welding precautions. The intent is to qualify the student for beginning work in the shop. Designed for Apple II+ and IIE

Oxyacetylene Welding Safety Part I
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
Part I covers correct clothing and protective clothing, proper welding conditions and environment, cylinder handling and storage. Designed for Apple II+ and IIE. $82.00

Oxyacetylene Welding Safety Part II
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
Part II includes correct use of regulators, pressure adjustments, proper use of the torch, and shutting down equipment. Designed for Apple II+ and IIE. $82.00

Welding Equipment Safety and Operations
Career Aids, Inc.
20417 Nordhoff Ave.
Department Z 9
Chatsworth, CA 91311
This teacher-designed, student-tested program covers the parts, safety, and operations of the major welding equipment used in a metal shop. Covers: Oxyacetylene Welding, Oxyacetylene Heating and Cutting, Arc Welding, Spot Welding, and Wire-Feed Welding. Designed for Apple II or IIe, TRS-80 Model III or 4, 48K. $69.95

Arc Welding & Related
Review
Career Aids, Inc.
20417 Nordhoff Ave.
Department Z 9
Chatsworth, CA 91311
Approximately 400 test
questions are contained
in this computer program.
Subjects covered include:
stock arc welding; TIG;
MIG; and metals and their
characteristics. Designed
for the Apple II or IIe,
48K. $29.95

TRANSPORTATION CLUSTER SOFTWARE

Aútomotive Techincian
Mathematics, Volume I
MECC
3490 Lexington Ave. North
St. Paul, Minnesota 55112
Individualized programs on whole numbers and fractions which assist students in applying math skills to realistic problems they will encounter as an automotive technician. Designed for Apple. $44.00

Automotive Technician
Mathematics, Volume II
MECC
3490 Lexington Ave. North
St. Paul, Minnesota 55112
Realistic problems from the field of automotive mechanics help vocational students learn to apply skills in using decimals and percents to situations they will encounter on the job. Designed for the Apple. $44.00

Diesel Engines
Career Aids, Inc.
8950 Lurling Ave.,
Department J 9
Chatsworth, Calif. 91311
Self instructional program that teaches the basic principles and operation of diesel engines. Designed for TRS-80 Model I or III. $20.00

Diesel Engines
Queue
5 Chapel Hill Drive
Fairfield, Conn. 04632
Teaches the principles and operation of diesel engines with step by step description and graphics. Designed for TRS-80 Model I or III. Disk $15.00

TRANSPORTATION CLUSTER SOFTWARE

Ignition Systems
Queue
5 Chapel Hill Drive
Fairfield, Conn. 06432
Self teaching program on auto ignition systems (both older point and condenser systems and new electronic units.) Designed for TRS-80 Model I or III. Disk $15.00 Cassette $20.00

Auto Mechanics Series
Cliffe Rice & Assoc.
P.O. Box 333
Cleveland, Georgia 30528
Consists of 16 vocational programs on Auto Mechanics (Dorsett filmstrip programs have been adapted to the computer.) Designed for Atari 400-800

Auto Tutorial
Cliffe Rice & Assoc.
P.O. Box 333
Cleveland, Georgia
30528
This program includes materials on mechanics, checking out a car, safety in the shop, mileage, full performance, figuring charges, and pay check deductions. Designed for Atari, TRS-80
$79.00

Basic Auto Shop Safety
Part I
Abraxas
P.O. Box 1416
Eugene, Oregon 97440
This program covers correct use of hand tools, proper clothing, protective clothing, flammable and volatile liquids, and safe shop conditions. The intent is to qualify the student for beginning work in the shop. Designed for Apple II+ and IIE.
$78.00

GLOSSARY

We have chosen some of the most common computing terms to include in this glossary.

ACOUSTIC COUPLER: A mechanical device that allows a telephone handset to be connected to a modem.

ADDRESS: A way of identifying any location in the memory of a computer.

ALGORITHM: A detailed set of sequential steps which defines the solution to a problem.

APPLICATION PROGRAM: Software designed for a specific purpose.

ARTIFICIAL INTELLIGENCE: A specialized field of research in computer science. The term refers to the ability of a computer to perform functions normally carried out by the human brain.

ASCII: The American Standard Code for Information Interchange. The most generally used format for representing and exchanging textual information among computers. Under the code, each of 96 characters (letters, numbers, and symbols) is given a unique binary number code (1's and 0's).

ASSEMBLY LANGUAGE: A means of communicating with a computer at a low level. Assembly language lies between high-level languages and machine language. Programmers use assembly language to make efficient use of memory.

AUTHORING SYSTEM: Software designed to help authors, such as teachers, develop instructional materials for computers.

BACKUP: A copy of software that is kept in case the original is accidentally destroyed.

BASIC: (Beginners All - Purpose Symbolic Instruction Code) a programming language frequently used with microcomputers.

162

BINARY: Having two possible conditions, such as "0" or "1", that correspond to the "on" and "off" states of computer circuitry.

BIT: A binary digit; the smallest measure of computer information

BREAK: An interruption of a transmission. Most small computer keyboards have a Break key that tells the computer to stop what it's doing and wait for further instruction.

BUFFER: An area in the computer's memory used to temporarily store information. When using a printer, a buffer is needed because the printer operates much more slowly than the computer.

BYTE: A group of bits, usually 8 in microcomputers; the smallest measure used to express the number of characters which can be stfor
further instruction.

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further instruction.

CHIP: A thin wafer of silicon on which integrated electronic components are deposited.

COBOL: (COmmon Buiness Oriented Language) A high-level language developed for business data processing applications.

COMPUTER: A device that can store information, manipulate data and solve problems by use of a stored program.

COMPUTER LITERACY: The ability to control and program computers for academic, profesional and personal uses; to assess the technical qualities and substantive strengths and weaknesses of hardware, software and courseware; and to understand the impact of computers on society, work and education.

DATA BASE: A stored collection of the libraries of data that are needed by organizations and individuals to meet their information processing and retrieval requirements.

DATA BASE MANAGEMENT SYSTEM: The comprehensive software system that builds, maintains, and provides access to a data base.

DEBUG: To locate, remove and correct mistakes in a computer program

DISK: A revolving platter upon which data and programs are stored.

DISKETTE: A floppy disk. A low-cost magnetic medium used for I/O and secondary storage purposes.

EDIT: To correct, rearrange, and validate input data. To modify the form of output information by inserting blank spaces, special characters where needed, etc.

FILE: A block of information that, when combined with others, makes up a group of related data on a disk.

FIRMWARE - Software that has effectively been made permanent by storing it in hardware

FLOPPY DISK: See diskette

164

FLOWCHART: A Diagram that uses symbols and interconnecting lines to show the logic and sequence of specific operations.

FORTRAN: (FORmula TRANslator) A high-level language used to perform mathematical computations.

HARD COPY: A printout on paper

HARDWARE: The physical equipment, mechanical or electronic, of the computer system

HIGH-LEVEL LANGUAGE: A method of programming that allows a person to give instructions to a computer in a form using letters, symbols, or English-like text, rather than in the 1's and 0's code which the computer understands.

IMPACT PRINTERS: A printer that produces hard copy by physically striking a ribbon and paper.

INPUT: The transfer of data into the computer.

I/O: (Input/Output) The passage of information into the computer

INTERACTIVE: A computer system where a two-way conversation goes on between the user and the computer.

INTERFACE: A piece of hardware or software used to connect two devices (computers and peripherals) that cannot be directly hooked together.

INTERPRETER: A computer program which translates a single line of a high-level language at a time for the computer. Interpreters are more convenient but less efficient than compilers.

K: 1,024 bytes of information that can be stored in the computer system; a computer that has 256K memory has a capacity of 256 times 1,024 bytes of memory; often spoken of as 1,000 but actually 1,024.

MACHINE LANGUAGE: The "native language" of a computer, those fundamental instructions the machine is capable of recognizing and executing. The instructions are represented by binary code (1's and 0's).

MAGNETIC INK CHARACTER RECOGNITION: (MICR) The recognition of characters printed with a special magnetic ink by machines.

MANAGEMENT INFORMATION SYSTEM: (MIS) A computer-based information system designed to supply organizational managers with the necessary information needed to plan, organize, staff, direct, and control the operation of the organization.

MICROCOMPUTER: The smallest category of computer, consisting of a microprocessor and associated storage and input/output elements.

MICROPROCESSOR: The basic arithmetic, logic, and storage elements required for processing.

MINICOMPUTER: A relatively fast but small and inexpensive computer with somewhat limited input/output capabilities.

MODEM: An electronic device that allows computer equipment to send and receive information through telephone lines.

MULTIPROCESSOR: A computer network consisting or two or more central processors under a common control.

MULTIPROGRAMMING: The simultaneous handling of multiple independent programs by interweaving or overlapping their execution.

NETWORK: An interconnected system of computers and/or terminals. The components do not have to be physically close to one another and are often connected by telephone lines.

ONLINE: A term describing persons, equipment, or devices that are in direct communication with the CPU.

OPERATING SYSTEM: An organized collection of software that controls the overall operations of a computer.

PASCAL: A popular high-level language that facilitates the use of structured programming techniques.

PERIPHERALS: Equipment that is external to the computer itself.

PRINTER: An output device that produces hardcopy.

PROGRAM: A set of instructions that tell a computer to do something.

PROM: A read-only storage device that can be programmed after manufacture by external equipment.

RAM: Random-access memory. The main type of memory used in a small computer. The time required for the computer to find one piece of information in RAM is essentially the same no matter where the information is stored.

ROM: Read-only memory. Memory where information is permanently stored and cannot be altered.

RS-232C: A technical specification published by the Electronic Industries Association which specifies one way in which a computer communicates with a peripheral.

SERVICE CONTRACT: A repair contract

SOFTWARE: Programs or segments of programs that is in contact with hardware.

SYSTEM: An organized collection of hardware and software that works together.

SYSTEM SOFTWARE: General purpose programs that allow programmers to write or modify applications programs.

TELECOMMUNICATION: Transmission of data between a computer and another computer or terminal in a different location.

TERMINAL: A piece of equipment with a keyboard for input and an output device such as a CRT or printer. A terminal is used to communicate with the computer.

TIMESHARING: A process wherby the facilities of a single computer are shared by a number of users.

WORD PROCESSING: The entry, manipulation, editing, and storage of text using a computer.